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METROPOLITAN ASYLUMS BOARD.

REPORT

RE

RETURN CASES

OF

SCARLET FEVER AND DIPHTHERIA

Between JULY, 1901, and JULY, 1902.

By A. G. R. CAMERON, M.B., D.P.H.,
Medical Investigator for the Board.

TOGETHER WITH THE OBSERVATIONS OF THE MEDICAL SUPERINTENDENTS OF THE BOARD'S FEVER HOSPITALS THEREON.

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METROPOLITAN ASYLUMS BOARD,
EMBANKMENT,
E.C.

15th September, 1905.

Sir,

Investigation of Return Cases of Scarlet Fever
and Diphtheria.

I have pleasure in forwarding herewith a copy of the report of Dr. A.G.R. Cameron on the above-named subject.

I am, Sir,
Your obedient Servant,
T. Duncombe Mann
Clerk to the Board.

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REPORT.

March, 1904.

To the Hospitals Committee of the Metropolitan Asylums Board.

I beg to submit the following Report on my investigations into "return cases" of Scarlet Fever and Diphtheria, which arose in connection with patients discharged from the Board's Fever Hospitals.

My instructions were to follow the lines adopted by Professor Simpson in his enquiry, extending from October, 1898, to March, 1899. I commenced my investigations on July 1st, 1901, and concluded them at the end of July, 1903.

The period covered by this Report extends from July 1st, 1901, to July 31st, 1902. The first portion deals with "return cases" of Scarlet Fever; the latter, with Diphtheria.

The main object of my work has been to ascertain the conditions under which "return cases" arise, and to discover whether the incidence of those cases bears any relation to their period of detention in hospital.

The total number of enquiries made during the thirteen months amounted to nearly 900, of which about 800 were in connection with "return cases" of either Scarlet Fever or Diphtheria.

The lines upon which my enquiry into each individual case was conducted are indicated in the "return case" form and investigation sheet appended to this report (pp. 190-193).

Part I.

SCARLET FEVER.

Definition of Terms.—To avoid confusion, it will be well here to define the terms used in this report, since the term "*return case*" is frequently applied both to the patient who returns from hospital, and to the patient whom he infects after his return.

Infecting case.—Any patient who on discharge from hospital infects, or is alleged to have infected, another is referred to as the "infecting case"; the person infected, or alleged to have been infected, as the "return case."

Secondary cases.—Cases occurring in a house at intervals after the outbreak of the disease, that is, after the illness of the first case, are called "secondary cases." This term, therefore, is not synonymous with "return case."

The Interval.—The period elapsing between the discharge of the "infecting case," and the onset of illness of the *first* "return case," is termed the "interval," which is not limited to any fixed duration of time.

On receipt of the form, the house to which the "infecting case" had been discharged, was visited at the earliest opportunity. The "infecting case" and his surroundings were examined, and a detailed enquiry made into the disinfection and other points set forth on the investigation sheet. More than one visit was occasionally necessary, nor did the investigation always terminate at the patient's home; and further, the cases being frequently far apart, it will be readily seen that a considerable time was required to carry out the enquiry with efficiency and care, and that only a limited number of cases could be dealt with in one day.

I.

Incidence of Infecting Cases.

During the thirteen consecutive months, beginning July 1st, 1901, I investigated 688 fresh outbreaks of scarlet fever, which occurred after the discharge from hospital of 16,702 recovered patients. The number of persons infected was 949. Calculated on the total discharges, this gives 4·1 per cent. for "infecting cases," and 5·6 for "return cases."

In thirty instances, the "return cases" of scarlet fever were subsequent to the discharge of patients who had suffered from diphtheria only. If these be deducted, the percentage of "infecting cases" will be 3·9, instead of 4·1.

The number of "infecting cases" may appear large, but this is partly to be accounted for by the fact that every case brought to my notice has been included, whether the "infecting case" was a member of the same family, or lived in the same house as the "return case," or not. Cases were also included, which, in not a few instances, were obviously not the cause of the "return case," for example, when the latter was taken ill on the day or day before the discharged patient returned. Making the "interval" unlimited has also tended to swell the number of "infecting cases." The effect of this is shown in the following table :—

Table 1.

"Interval."	Two weeks.	Three weeks.	Four weeks.	Six weeks.	Unlimited.
"Infecting Cases"...	505	581	622	670	688
Percentage of ditto on "All Cases" discharged	3·	3·4	3·7 *2·9	4·	4·1
		* Professor	Simpson's	estimate.	

With an "interval" of two weeks, the number of "infecting cases," calculated on the total discharges, is 3 per cent. With an "interval" of four weeks, 3·7 per cent.; six weeks, 4 per cent.; and unlimited, 4·1 per cent.

I have divided the "infecting cases" into three groups, A, B, and C.

Under Group A are classified those cases in which the evidence indicated that the "return cases" were infected by the discharged patient;

Under Group B, those cases in which the evidence conclusively showed that the "return cases" were mere coincidences, and did not derive infection from the alleged "infecting cases";

Under Group C, doubtful cases, in which the evidence was insufficiently conclusive to enable me to arrive at a definite decision.

The proportion of cases located in each of these three groups, is also affected by the length of the "interval"—the shorter the "interval," the larger will be the proportion of the cases in the first group—as shown in the following table.

Table 2.

"Interval."	No. of Infecting Cases.	A.	B.	C.
Unlimited	688	40·5	22·5	36·9
Six weeks	670	41·64	20·89	37·46
Four weeks	622	44·6	17·2	38·1
	*193	46·6	about 46·5	about 6·9
Three weeks	581	46·98	14·28	38·72
Two weeks	505	50·89	11·48	37·62

* Calculated from Professor Simpson's "Report on Return Cases."

On examining the table, it will be seen that, while the proportion of cases in group A. varies from 40·5 to 50·8 per cent., according to the length of the "interval," the proportion of doubtful cases (Group C.) remains almost unaffected.

II.

The "Interval."

Table, showing the "interval" between the discharge of the "infecting case," and the onset of illness of the *first* "return case":—

TABLE 3.

(Period—July, 1901, to July, 1902.)

	Under 1 week.	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	Total.
Group A....	174	83	16	5	1	...	...	...	...	...	...	...	...	279
„ B....	34	24	25	24	22	11	4	5	3	...	1	1	1	155
„ C....	114	76	35	12	8	6	2	1	...	...	...	...	...	254
Total ..	322	183	76	41	31	17	6	6	3	...	1	1	1	688
Percentage	46·8	26·5	11·	5·9	4·5	2·4	·8	·8	·4	...	...	·4	...	...

Within an "interval" of one week 46·8 per cent., or nearly half of the above "return cases," were attacked. In the second week, after the discharge of the "infecting case," 26·5 per cent., or about one quarter of the cases occurred; while in the third week, only 11 per cent. was recorded. After this period, the number of cases rapidly decreases, until the eighth week, when the association of the discharge of patients from hospital, and the occurrence of "return cases" practically ceased.

In the A. Group, only one case occurred after an interval of four weeks from the discharge of infecting case.

In B. Group, single cases occurred in the 11th, 12th, and 13th weeks.

In Group C., the return cases practically ceased, after an interval of six weeks.

III.

The Period of Detention.

From August, 1901, to July, 1902, 15,501 patients were discharged. The largest number for any individual month, was in January—1,633; the smallest, in June—939.

The Acute Hospitals discharged 10,818 patients. Of these, the Park and the Fountain Hospitals are together responsible for 40 per cent., and the Brook and the South-Eastern Hospitals together, about 20 per cent., and the remaining hospitals, 40 per cent.

From the Northern Hospital were discharged 4,160 patients, or over one-fourth of the total number of cases.

Monthly discharges.—The average period of detention of the patients discharged during the twelve months was 64·5 days. In nine months of the year it varied from 64 to 69 days. In the remaining three months, November, December, and July, from 58 to 59 days. In several of the hospitals the average for each month varied considerably throughout the year; in one or two instances the difference being as much as 20 days. And the longest period of detention at each hospital did not occur in the same month. In fact, sometimes, an unusually long detention at one hospital synchronised with an unusually short one at another.

Average period of detention for each hospital.—Of the several Acute Hospitals, the Park detained patients the shortest time, namely 53·1 days; the next in order is the Fountain Hospital, with 60·6 days; the Brook and the South-Eastern Hospitals being bracketed with 64·5 and 64·8 days, respectively.

The periods of detention at the following hospitals are all above the average, the figures shewing 65 days at the North-Western, 69·5 at the North-Eastern, at the Western 69·8, and at the South-Western 71·6 days.

Thus at the Acute Hospitals, 40 per cent of the cases were detained below, and 20 per cent. above, the average period of detention.

At the Convalescent Hospitals, the average period of detention, including the previous detention at the Acute Hospitals, was 64·7 for Gore Farm Hospital, and, for the Northern Hospital, 68·4 days.

The following table gives the average period of detention and the percentage of "infecting cases," calculated on the total discharges from each hospital.

(Group B. Cases are excluded from this table.)

TABLE 4.

(August, 1901, to July, 1902.)

	G.F.H.	N.H.	N.E.H	W.H.	F.H.	S.W.H.	S.E.H.	N.W.H.	B.H.	P.H.
Percentage of "infecting cases" on total discharges.	1·7	2·5	2·3	2·9	3·1	3·3	3·3	4·	4·1	4·4
Average period of detention ("All Cases.")	64·7	68·4	69·5	69·8	60·6	71·6	64·8	65·	64·5	53·1

Only a few cases of scarlet fever were discharged from the Eastern Hospital, and for this reason it has been omitted from the table.

These figures appear to indicate that, although the hospitals which detain their patients the longest have, on the whole, the least number of "infecting cases," a long detention does not necessarily ensure favourable results.

The figures in the above table are shown in the accompanying Chart I.

In the following tables are given the periods of detention of the "infecting cases" and "all cases" discharged during the same period.

TABLE 5.

(August, 1901, to July, 1902, inclusive).

	Under 2 weeks.	— 4	— 6	— 8	— 10	— 12	— 14	— 16	Over 16	Total.
"Infecting cases"	—	3	41	209	210	112	34	24	20	653
Percentage	---	·45	6·27	32·06	32·15	17·13	5·20	3·67	3·06	
								6·73		
"All Cases"	15	88	975	5070	4667	2258	1222	1206		15,501
Percentage	·09	·56	6·28	32·70	30·10	14·56	7·38	7·78		

TABLE 6.

	Under 8 weeks.	8 — 12	12 weeks and over.	
"All Cases"	39·6	44·6	15·6	per cent.
"Infecting Cases"	38·7	49·3	11·9	per cent.

To face page 4.

CHART I.

Showing for each Hospital the average period of detention of "ALL CASES" and of "INFECTING CASES," also the percentage of "INFECTING CASES" on the total discharges. August, 1901, to July, 1902.

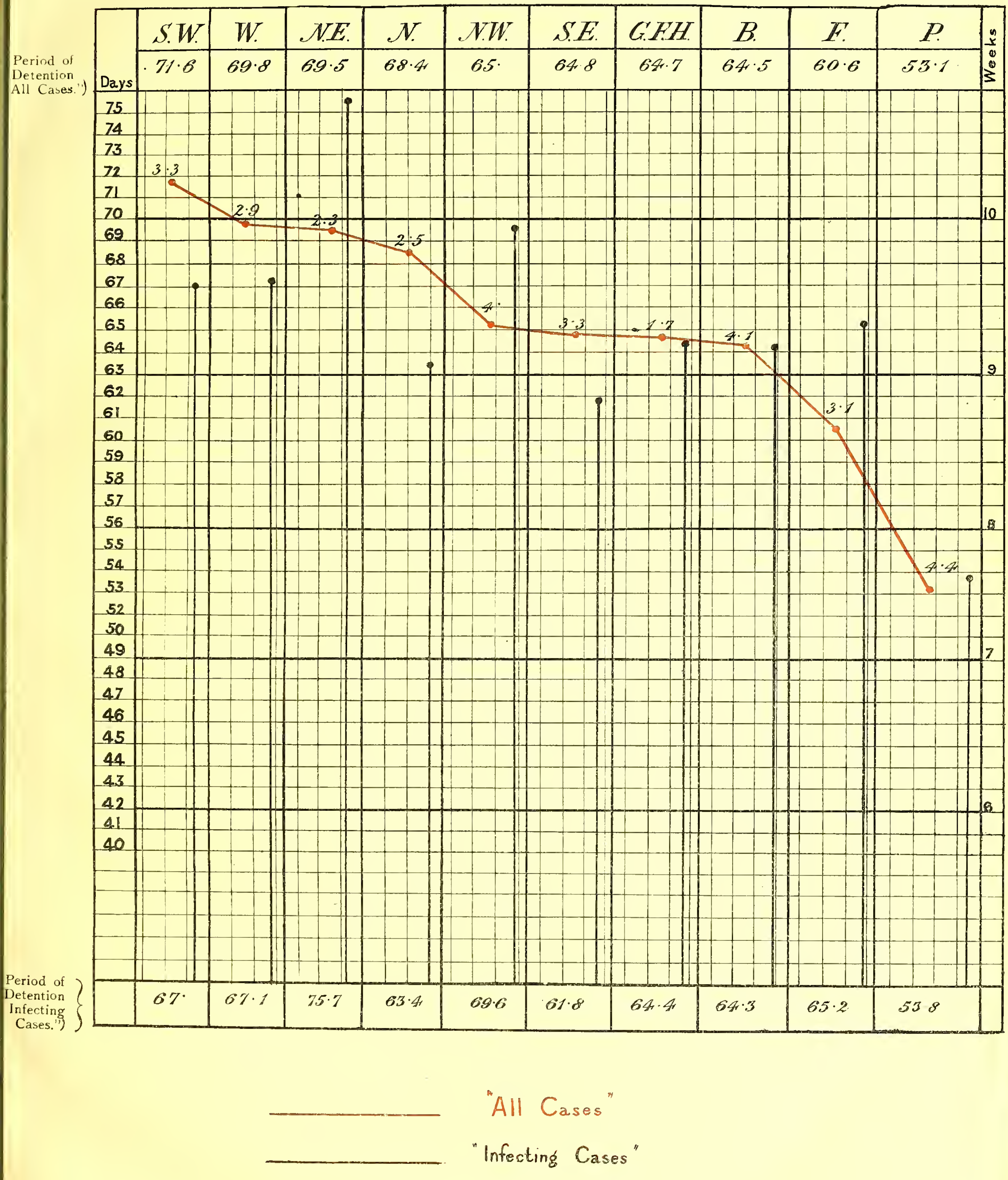
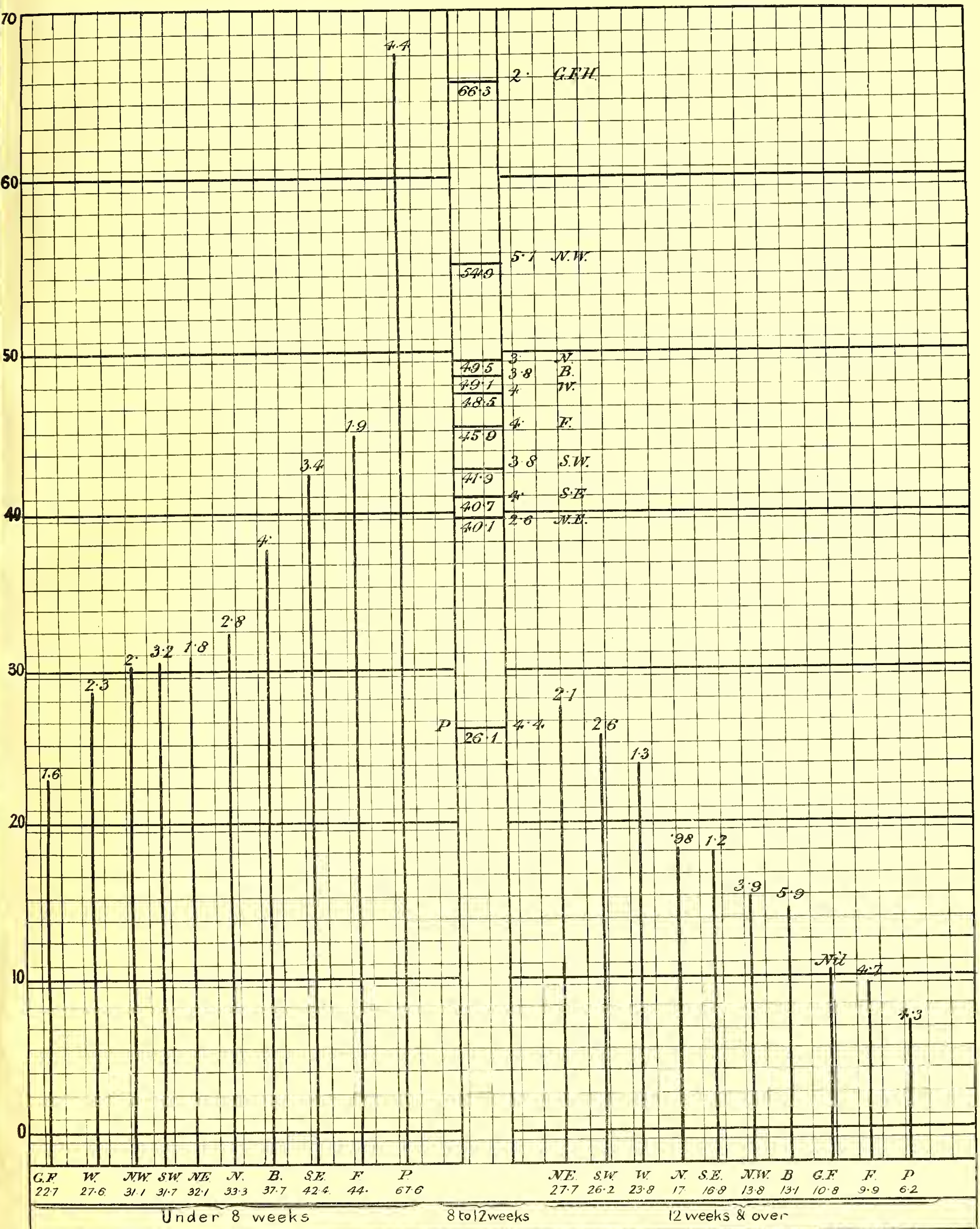


CHART III.

Showing for each Hospital the proportion of Patients discharged under 8 weeks, 8 to 12 weeks, and 12 weeks and over. Also the percentage of "INFECTING CASES" arising in each group. August 1901 to July 1902.



	G.F.H.	N.H.	N.E.H.	W.H.	F.H.	S.W.H.	S.E.H.	N.W.H.	B.H.	P.H.
Percentage of "Infecting Cases" on Total Discharges.	1·7	2·5	2·3	2·9	3·1	3·3	3·3	4·	4·1	4·4
Average period of Detention. ("All Cases")	64·7	68·4	69·5	69·8	60·6	71·6	64·8	65·	64·5	53·1

From a comparison of the figures in the foregoing tables it will be seen that, the percentages of "infecting cases" and "all cases," is about equal at each period of detention up to eight weeks. Taking the next two periods, of eight to ten, and ten to twelve weeks, the percentage of infecting cases is unduly large. From this point it becomes relatively smaller, indicating that the largest proportion of such cases occurs among the patients discharged after a detention of eight to twelve weeks, and the smallest among those sent out after this period.

The sub-division into the three periods, under eight weeks, eight to twelve, and twelve weeks and over, corresponds roughly to a clinical one. The cases discharged *under eight weeks* are, as a rule, uncomplicated, and, as they are believed to eliminate their infection soonest, are specially selected, and sent out earliest.

Eight to twelve weeks.—The patients discharged at this period, have generally had more severe attacks. Most of them suffer from secondary complications, such as tonsillitis, adenitis, nephritis, and diseases of the ear, and many of them from mucous discharges, which are known to be frequently the cause of "return cases," and for this reason they are detained longer.

Twelve weeks and over.—These cases include patients suffering from superadded infectious diseases and relapses, quarantined cases, those with severe complications, and also cases belonging to the previous group, which were not sufficiently well to be sent out sooner.

In the following tables are given the number of patients discharged at each period of detention and the proportion of those who, subsequent to discharge, were associated with the illness of "return cases."

TABLE 7.
(August, 1901, to July, 1902.)

Period of Detention.	No. of Discharges.	No. of "Infecting Cases."	Percentage.
Under 4 weeks	* 103	3	2·9
4 to 6 „	975	41	4·20
6 „ 8 „	5070	209	4·12
8 „ 10 „	4667	210	4·49
10 „ 12 „	2258	112	4·96
12 „ 14 „	1222	34	2·78
14 and over	1206	44	3·64
Total	15,501	653	4·2

If these figures be grouped differently, the percentage of the "infecting cases" will be as follows:—

TABLE 8.

Under 8 weeks.	8 to 12 weeks.	12 weeks and over.
4·1	4·6	3·2

Or under 8 weeks, and over 8 weeks 4·1 and 4·2 per cent., respectively.

* N.B.—Many of the patients discharged under four weeks were admitted desquamating.

These figures, therefore, show that the complicated cases—those discharged after eight weeks—give as favourable results as the uncomplicated, and, of the former cases, those detained the longest give the best results. From this I conclude that the period of detention has a marked influence in reducing the number of "infecting cases," and, consequently, that long detention is not a cause of "return cases."

In Charts II. and III. these results are shown separately for each hospital.

Chart II. gives the proportion of "all cases" and of "infecting cases" discharged under 8 weeks, 8 to 12 weeks, and 12 weeks and over; Chart III. the proportion of patients discharged, and the percentage of "infecting cases" in each of these three periods. *Vide* Appendix, Table 14.

An examination of these Charts in conjunction with the following table, in which the percentages of "infecting cases" in each period are set forth, shows that while the results of the several hospitals, in the main, support my conclusions, there are, however, some exceptions.

TABLE 9.

(August, 1901, to July, 1902.)

<table>
<tr><th rowspan="2">Hospital.</th><th>[1]Uncomplicated Cases.</th><th colspan="2">[2]Complicated Cases.</th></tr>
<tr><th>Under 8 weeks.</th><th>8 to 12 weeks.</th><th>12 weeks and over.</th></tr>
<tr><td>Brook ... ...</td><td>4·</td><td>3·8</td><td>5·9</td></tr>
<tr><td></td><td></td><td colspan="2">4·2</td></tr>
<tr><td>Fountain ...</td><td>1·9</td><td>4·</td><td>4·7</td></tr>
<tr><td></td><td></td><td colspan="2">4·1</td></tr>
<tr><td>South-Eastern...</td><td>3·4</td><td>4·</td><td>1·2</td></tr>
<tr><td></td><td></td><td colspan="2">3·2</td></tr>
<tr><td>North-Eastern...</td><td>1·8</td><td>2·6</td><td>2·1</td></tr>
<tr><td></td><td></td><td colspan="2">2·4</td></tr>
<tr><td>Western ...</td><td>2·3</td><td>4·</td><td>1·3</td></tr>
<tr><td></td><td></td><td colspan="2">3·1</td></tr>
<tr><td>South-Western</td><td>3·2</td><td>3·8</td><td>2·6</td></tr>
<tr><td></td><td></td><td colspan="2">3·3</td></tr>
<tr><td>Park ... ...</td><td>4·4</td><td>4·4</td><td>4·3</td></tr>
<tr><td></td><td></td><td colspan="2">4·4</td></tr>
<tr><td>North-Western</td><td>2·</td><td>5·1</td><td>3·9</td></tr>
<tr><td></td><td></td><td colspan="2">4·8</td></tr>
<tr><td>Gore Farm ...</td><td>1·6</td><td>2·</td><td>Nil</td></tr>
<tr><td></td><td></td><td colspan="2">1·7</td></tr>
<tr><td>Northern ...</td><td>2·8</td><td>3·</td><td>·9</td></tr>
<tr><td></td><td></td><td colspan="2">2·1</td></tr>
</table>

"Infecting cases" under sub-division "Group B" are not included in this table. The three groups are shown in the Appendix. See Table 13.

[1] & [2] These terms are used in the sense explained in par. 2, page 5.

Thus, at five out of the ten hospitals, the cases discharged after detention of more than eight weeks, give less favourable results than those discharged under eight weeks. But in every instance, except two (the Brook and the Fountain Hospitals), the patients discharged after detention of over twelve weeks give better results than those discharged after a detention of 8 to 12 weeks.

Taking the Brook Hospital, it will be noted that, although the complicated cases gave almost as favourable results as the uncomplicated, it is, nevertheless, the only hospital that has its smallest percentage of "infecting cases" within the eight to twelve weeks' period.

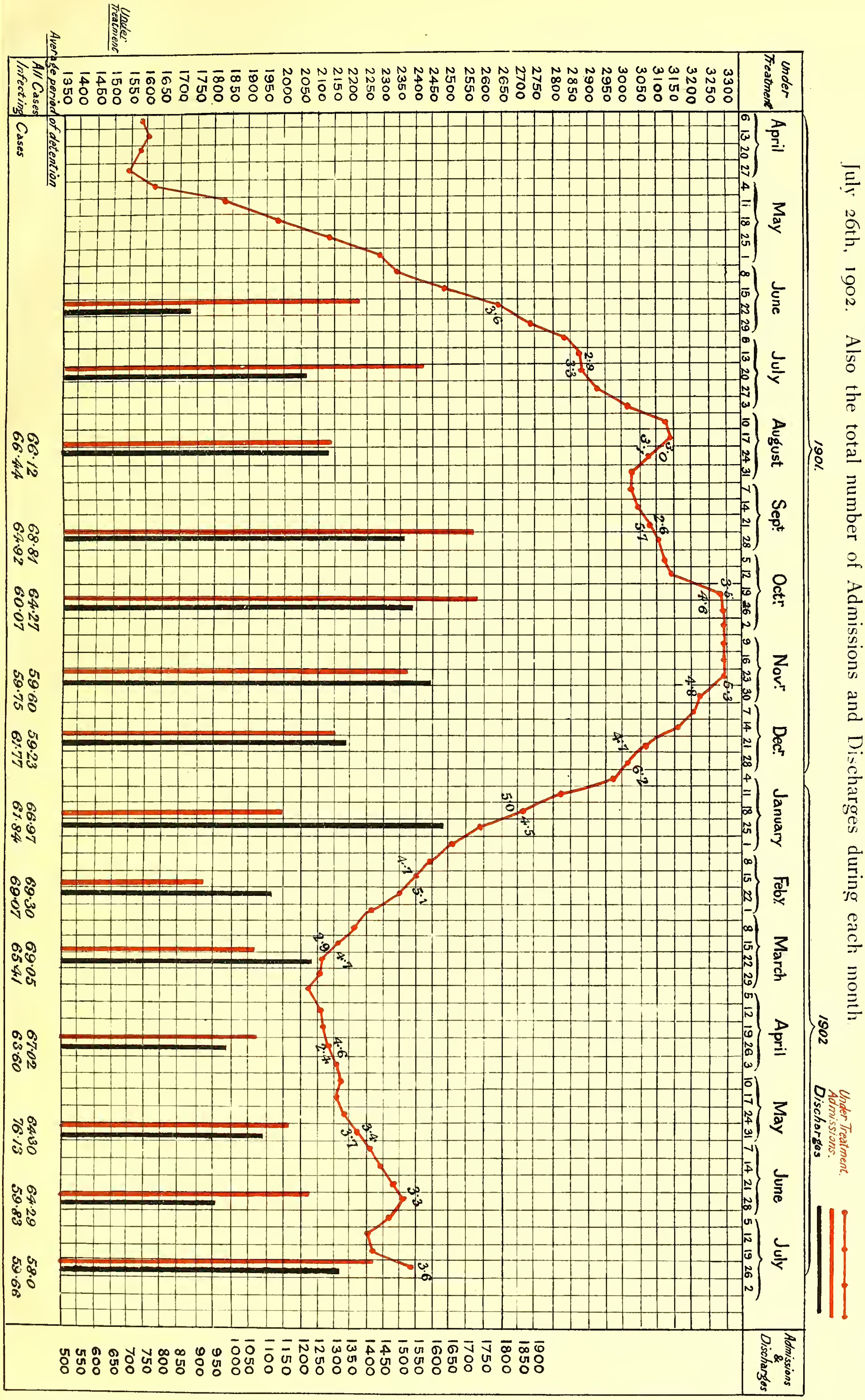
At the Fountain Hospital no less than 934 patients (44 per cent. of the total) were discharged under eight weeks, giving only 1·9 per cent. of "infecting cases." Had the complicated cases at this hospital been detained longer it is not improbable that these remarkably good results would have been maintained.

The results at the Park Hospital are singular, in that the percentage of "infecting cases" is the same at each period of detention, which might be taken to mean that the duration of detention in hospital had little or no influence on the number of "infecting cases." The fallacy of this argument is exposed by comparing these statistics with those of the other hospitals. The uniformly high percentage of "infecting cases," and the low average period of detention, suggest that the latter is generally too short.

On further examination of these tables and charts, it will be seen that the proportion of patients discharged, and the percentage of "infecting cases" at each period of detention, show wide variations at the several hospitals. Having regard to the fact that in the discharge of scarlet fever patients, where no bacteriological test can be applied, reliance must chiefly be

To face page 6.

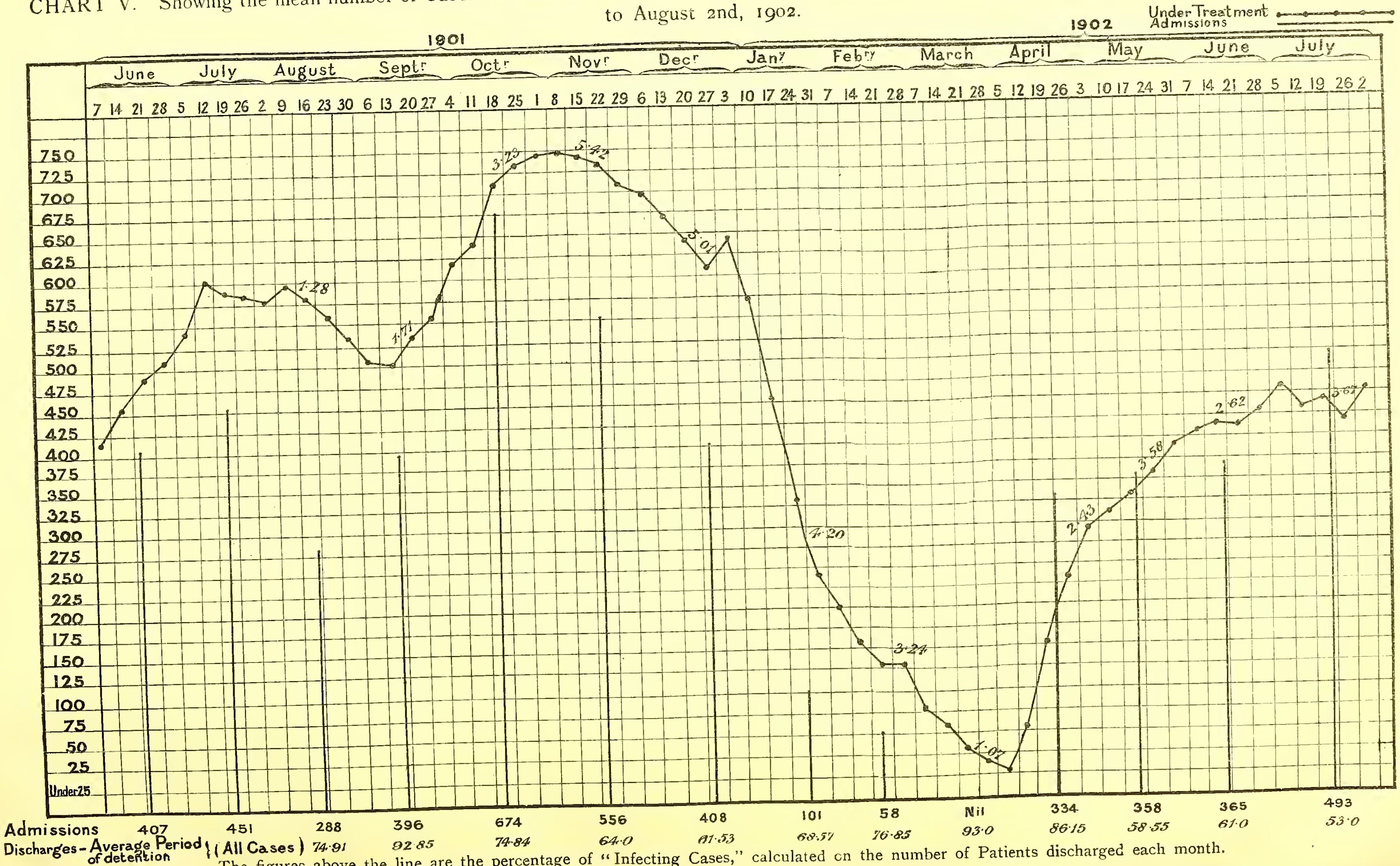
CHART IV. Showing the mean number of Scarlet Fever Patients remaining under treatment each week from April 6th, 1901, to July 26th, 1902. Also the total number of Admissions and Discharges during each month.



Above the line is the percentage of "Infecting Cases," calculated on the number of Patients discharged. Below the line the figures represent the percentage of cases admitted each month, who subsequent to discharge were associated with the illness of "Return Cases."

To face page 6.

CHART V. Showing the mean number of Cases of Scarlet Fever remaining under treatment each week at the Northern Hospital from June 1st, 1901, to August 2nd, 1902.



The figures above the line are the percentage of "Infecting Cases," calculated on the number of Patients discharged each month.

placed on clinical observation and on the duration of the patients' illness, the results indicated by the figures should occasion no surprise.

As a general rule, in scarlet fever, the cessation of infection is coincident with the termination of certain clinical signs and morbid manifestations of the disease, and to a great extent the period of detention of the patients depends on the duration of these symptoms. Their presence, however, is not always an indication that the patient is still infectious, and, unfortunately, their absence is not a proof to the contrary. Nor can too much reliance be placed on the duration of the illness, for, as these tables show, after many weeks of detention the patient may still be infectious. Each case, therefore, has to be decided on its own merits, and, in the circumstances, it is not surprising that at times it is most difficult, if not impossible, to say when a patient has ceased to be infectious. So that, while some patients may be discharged prematurely, others are probably kept in hospital unnecessarily long. The patients for discharge have, therefore, to be selected, and the selection of suitable cases must depend on some standard created by individual experience, and this, I venture to suggest, explains the absence of uniformity in the results of the various hospitals. I refer more especially to the patients discharged under eight weeks.

As already mentioned, the patients discharged at this period are the mildest cases, and since they are believed to retain infection for the shortest time they are specially selected, and sent out earliest. But touching the proportion to be discharged, there appears to be some difference of opinion. One hospital discharges under eight weeks 67 per cent. of its cases, another only 22 per cent. ; two hospitals from 40 to 50 per cent., and the remaining hospitals from 30 to 40 per cent.

There being no reason to believe that the types of disease admitted to the Acute Hospitals can differ very much, if at all, the inference is that the standard of fitness for discharge is not the same at all hospitals.

But a difference in the standard is not the only explanation, for, if the results are compared of the hospitals which discharged in the same period almost the same proportion of cases it will be found that the number of "infecting cases" varies from 1·8 to 3·2 per cent. In this case, apparently, the standard is the same, but the selection appears to be different, otherwise more uniformity in the results would be found.

How then are premature discharge on the one hand, and an unnecessarily long period of detention on the other to be avoided? I am of opinion that a great deal of valuable information might be obtained on this point by following up a large number of patients after they are sent home, a course which, if adopted, would undoubtedly result in the readier detection of the type of patient causing these "return cases." For example, it might be found that while patients suffering from desquamation, or even otorrhœa, can be discharged with safety, others, who have such complications as adenitis, or slight sore throat—however trivial these affections may appear to be at the time—should be detained longer. If a tabular statement was kept of the complications in hospital, and the condition on discharge of all cases, it would facilitate the enquiry, and reference could be made to it from time to time.

IV.

The transfer of patients to the Convalescent Hospital, and its effect on the number of "Infecting Cases" at the Acute Hospitals.

As patients suffering from mucous discharges are frequently associated with the illness of "return cases," the suggestion has been made that those hospitals which relieve themselves of the responsibility of discharging these cases by sending them to the Convalescent Hospital, should shew the smallest number of "infecting cases" in their records.

I have, therefore, prepared a number of tables with a view to ascertaining whether there is any evidence in support of this suggestion.

The months in which patients were transferred. All the hospitals did not transfer patients regularly throughout the year, the Park and the Brook transferring only in August, 1901. The Fountain sent no transfers to the Convalescent Hospitals from September, 1901, to March, 1902, nor did the South-Western Hospital send any during the first five months of 1902. On the other hand, the North-Western and the Western Hospitals transferred in every month except one, and the North-Eastern and South-Eastern Hospitals in every month except two. The number of patients transferred corresponded closely to the number of patients under treatment—*see* Charts IV. and V. When the admissions to the Acute Hospitals increased, the transfers did likewise, but as the number of patients under treatment diminished the transfers fell also, and in the month of March, when the number under treatment was at its lowest, there were no transfers; after this they began again, corresponding to the increased admissions to the Acute Hospitals.

Proportion of patients transferred. If the accompanying Chart VI. be examined, it will be seen that the hospital which transferred the most cases provides as many "infecting cases" as those which only transferred a few.

The North-Western Hospital transferred as many as 59 per cent. of their cases. The South-Eastern, North-Eastern, and Eastern Hospitals, from 40 to 50 per cent. each; the Fountain, South-Western, and Western Hospitals, in the order mentioned, 10, 20, and 30 per cent.; and the Park and Brook Hospitals only 2·3 and 3·2 per cent. respectively.

In the table below is shewn the number of those patients discharged from each hospital, who, during their retention therein, suffered from a mucous discharge lasting, intermittently or otherwise, for a period of one month. (See Appendix, Tables 35 and 36.)

If the hospitals that transfer the largest number of mucous cases supply the most favourable results, then the converse should hold good, and the number of "infecting cases" at each hospital should be proportionate to the mucous cases discharged.

TABLE 10.

(August, 1901, to July, 1902.)

Hospital.	Patients discharged that suffered from Mucous discharge.	Total number of "Infecting cases."	Percentage of "Infecting cases" on Mucous discharges.	*Patients that suffered from Mucous discharge (17 per cent.)
Western	159	27	17·	—
South-Eastern ...	73	16	21·9	12
North-Eastern ...	146	34	23·2	24
Fountain	259	67	25·8	44
North-Western ...	139	37	26·6	23
South-Western ...	101	29	28·7	17
Brook	210	69	32·8	35
Park	282	98	34·7	47

* If the mucous cases discharged from each hospital gave rise to the same proportion of "infecting cases," say 17 per cent., as at the Western Hospital—then the figures in this column, instead of the actual number shown in the second column, should represent the number of "infecting cases."

On referring to the table it will be seen that the Western Hospital had 159 cases of mucous discharge, and 27 "infecting cases," which is equivalent to 17 per cent. At the Brook, Park, and Fountain Hospitals the number of "infecting cases" was 69, 98 and 67 respectively. Had the proportion of "infecting cases" to mucous discharges been the same at these hospitals as at the Western, *i.e.*, 17 per cent., then the number of "infecting cases" would have been 35, 47 and 44. This indicates that the number of "infecting cases" at each hospital is by no means proportionate to the number of mucous cases discharged, so that those hospitals which transfer the largest number of mucous cases, will not necessarily have the fewest "infecting cases."

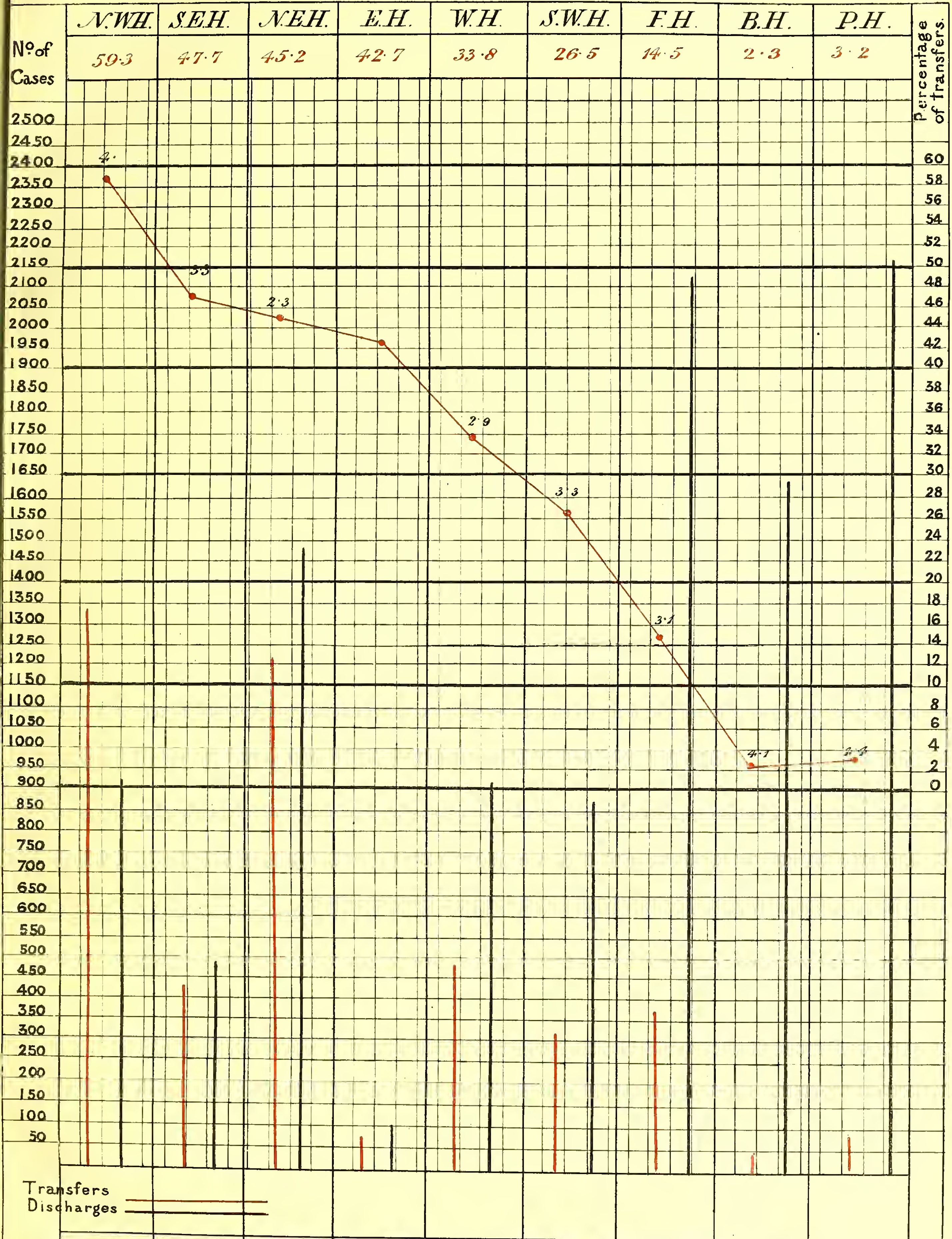
An essential condition in this enquiry, and one which it is not easy to secure, is that the number of the cases affected with mucous discharge, should be recorded with the same degree of accuracy at all the hospitals. If this degree of accuracy has been attained, then the following table shows that mucous discharges occurred much more frequently at some hospitals than at others.

At the Western Hospital 17·1 per cent. of the admissions suffered from mucous discharges; at the North-Eastern, North-Western, and South-Western Hospitals in the order mentioned, 7·2, 7·5, and 8·7 per cent. At the remaining hospitals from 11·2 to 12·6 per cent.

To face page 8.

CHART VI.

Showing the proportions of Cases transferred to the Convalescent Hospitals and discharged from the Acute Hospitals. August '01, to July '02.



	N.W.H.	S.E.H.	N.E.H.	E.H.	W.H.	S.W.H.	F.H.	B.H.	P.H.
Transfers	1347	439	1224	82	472	317	361	40	75
Discharges	921	481	1478	110	923	875	2121	1647	2215

The line crossing the Chart represents the percentage of Patients transferred, and the numbers over the line (placed opposite the Hospitals to which they refer) the percentage of "INFECTING CASES," calculated on the number of discharges.

TABLE 11.

HOSPITAL.	* No. of cases that suffered from Mucous discharge.	Percentage on admissions.	No. of discharges that suffered from Mucous discharge.	Percentage of Mucous cases discharged.
South-Eastern	114	12·2	73	64·1
North-Eastern	201	7·2	146	72·7
Western	237	17·1	159	67·1
South-Western ...	109	8·7	101	92·7
North-Western ...	183	7·5	139	76·
Park	286	12·6	282	98·6
Brook	210	12·	210	100·
Fountain	279	11·2	259	92·9
TOTAL	1,619	10·6	1,369	83·8

* Cases admitted to the Convalescent hospital suffering from a Mucous discharge, are credited to the hospital from which they were transferred.

If, however, it is assumed that an equal number of cases of mucous discharge occurred at all the hospitals—say 12 per cent. on the total admissions—then the number of such cases discharged can be ascertained from the last table, which gives the proportion discharged from each hospital, for, even assuming that any inaccuracy in the records existed, it is improbable that this would affect the transfers and discharges unequally.

On such a basis, the following table is compiled :—

TABLE 12.

		Cases assumed to have suffered from mucous discharges.			"Infecting cases."
HOSPITAL.	Admissions.	No. of Cases.	No. of cases, assumed to have been discharged.	Percentage on "all cases" discharged.	Percentage on "all cases" discharged.
		Taken as 12 per cent. on total admissions.	For percentage discharged see previous Table.		
South-Eastern	929	111	71	14·7	3·3
North-Eastern	2,764	331	240	16·5	2·3
Western	1,378	165	112	12·2	2·9
South-Western	1,249	149	138	15·7	3·3
North-Western	2,424	290	220	23·8	4·
Park	2,263	271	267	12·	4·4
Brook	1,745	209	209	12·	4·1
Fountain	2,489	298	276	13·	3·1

Now, if the accompanying Chart VII, in which the figures are shown diagramatically, be consulted, it will be seen that, in accordance with the conclusions arrived at from a previous table, the number of "infecting cases" at the various hospitals is not proportionate to the number of mucous cases discharged.

Another method of pursuing this enquiry, and one which I believe to be the least fallacious, is to examine the results of the Northern Hospital, as the number of "infecting cases" debited to it should be proportionate to the type of case discharged.

If these discharges be sub-divided to show the hospitals from which they were originally sent, the patients from the hospitals which transferred the largest number of mucous cases, should give the least favourable results, and should there be any special selection, those sent latest should give the worst, since they would probably include a larger proportion of chronic mucous discharges.

Table showing the percentage of "infecting cases" on the number of patients discharged from the *Northern Hospital.*

The cases are grouped under the hospitals from which they were transferred, and according to the periods they were detained in the Acute Hospitals, prior to transfer.

("Infecting cases" classified under Group "B." are excluded.)

Table 13.

(August, 1901, to July, 1902.)

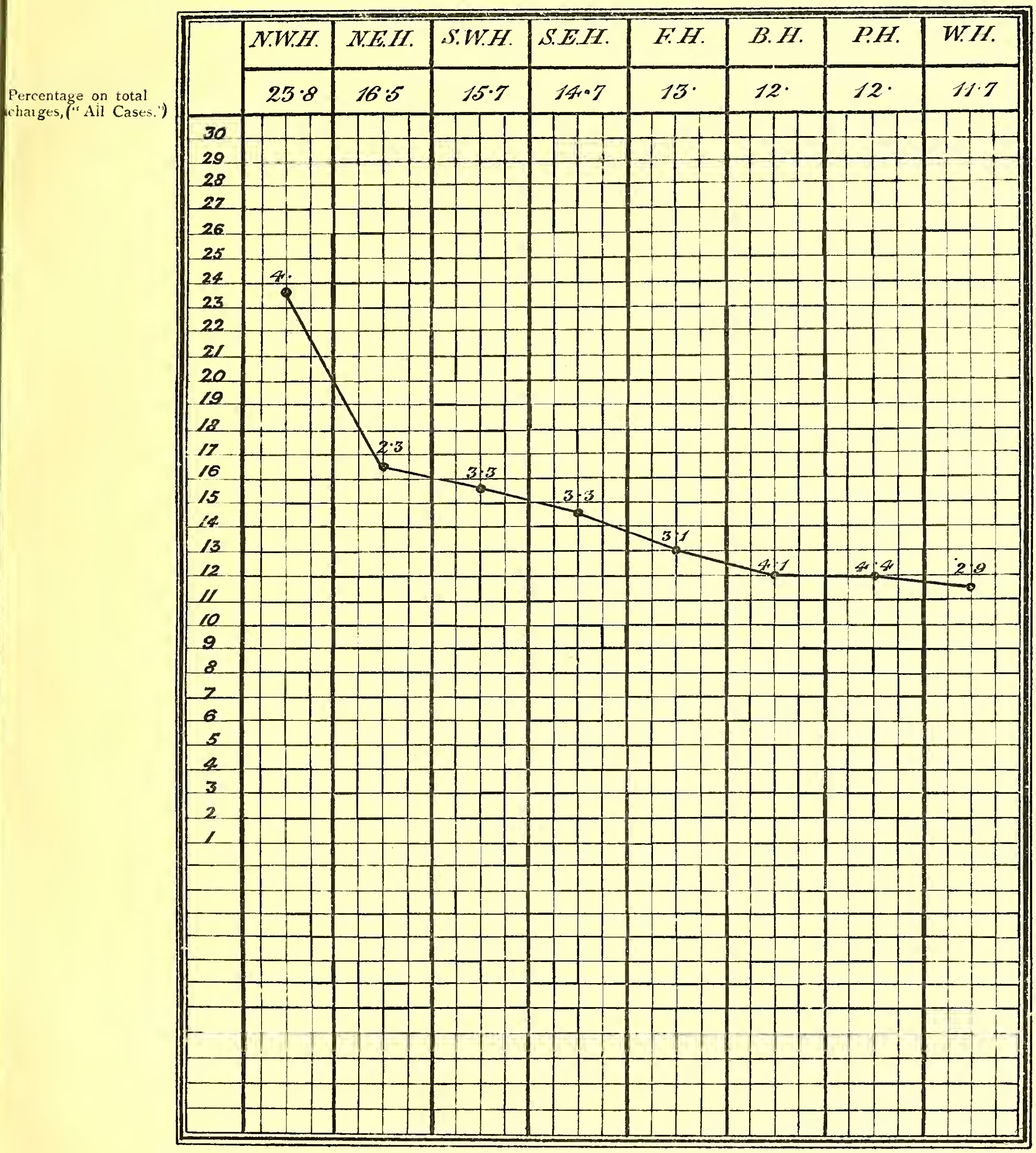
Period of detention in Acute Hospital.	N.E.H.	N.W.H.	W.H.	S.W.H.	S.E.H.	F.H.	E.H.	Total.
Under 2 weeks:								
Discharges ...	355	9	2	6	12	5	...	389
Percentage of ditto	25·3	·6	·39	2·7	3·7	2·2	...	9·3
Percentage of "infecting cases."	2·2	...	...	...	...	...	...	2·
2 to 4 weeks:								
Discharges ...	847	513	64	125	146	75	33	1803
Percentage of ditto	60·3	36·3	12·7	57·6	45·6	33·	42·3	43·3
Percentage of "infecting cases."	2·7	2·9	1·5	2·4	2·7	1·3	6·1	2·7
4 to 6 weeks:								
Discharges ...	186	633	282	75	106	78	34	1394
Percentage of ditto	13·2	44·8	56·	34·5	33·1	34·3	43·5	33·5
Percentage of "infecting cases."	1·6	2·5	3·9	4·	...	...	5·9	2·5
6 to 8 weeks:								
Discharges ...	11	171	92	10	41	40	8	373
Percentage of ditto	·78	12·1	18·2	4·6	12·8	17·6	10·2	8·9
Percentage of "infecting cases."	..	1·7	3·2	...	2·4	10·	...	3·2
8 weeks and over:								
Discharges ...	4	86	63	1	15	29	3	201
Percentage of ditto	·28	6·	12·5	·46	4·6	12·7	3·8	4·8
Percentage of "infecting cases"	...	2·3	1·5	...	...	3·4	12·5	1·9
Percentage of "infecting cases" on total discharges	2·3	2·5	3·1	2·7	1·5	2·6	6·4	2·5
Average period of detention in Acute and Convalescent Hospitals ...	66·24	69·26	76·68	62·15	70·13	63·32	61·29	68·46

To face page 10.

CHART VII

Showing the percentage of Patients discharged, that suffered while in Hospital from Mucous Discharges

(HYPOTHETICAL TABLE.)



The numbers above the line, placed opposite the Hospital to which they refer, are the percentage of "INFECTING CASES," calculated on the number of "ALL CASES," discharged.

In the previous table it will be noticed that 1·5 per cent. of the cases transferred from the South-Eastern were, after discharge from the Northern Hospital, associated with the illness of "return cases"; from the Western Hospital 3·1 per cent.; and from the remaining hospitals, namely, the North-Eastern, North-Western, Fountain and South-Western from 2·3 to 2·7 per cent.

The figures, as they stand, suggest that the South-Eastern Hospital transferred the fewest mucous cases, the Western the most, and the remaining four hospitals nearly the same amount, the Eastern Hospital being excluded from this comparison.

Now, if these last four hospitals be contrasted, it will be seen that, although the type of case transferred was apparently the same, yet the number of "infecting cases" at these hospitals varied from 2·3 per cent. at the North-Eastern, to 4 per cent. at the North-Western.

That the favourable results of the North-Eastern Hospital were not due to any special selection of transfers is also shown, on examining the table more in detail.

Over 25 per cent. of the transfers from this hospital were sent to the Northern Hospital, after a period of detention of less than two weeks; 85·6 per cent., after less than four weeks, and the remaining 14·2 per cent., after four weeks and over.

If there had been any selection, it could not have been on account of the severity or chronicity of the mucous cases, for the patients transferred last were associated with fewer "return cases," than those sent in the first fortnight of their illness, the latter patients presumably suffering from very mild attacks.

Nor do the collective results of all the hospitals indicate that the cases transferred were specially selected, for the patients transferred after a detention in the Acute Hospitals of less than four weeks, and those patients sent later, were associated with an almost equal proportion of "return cases"—the "infecting cases" being 2·6 and 2·5 per cent. respectively, and similarly the percentages of "infecting cases" for those transferred under six weeks, and after six weeks, were 2·5 and 2·7 respectively. So that early and late transfers give almost equally good results.

An examination, then, of the foregoing tables and charts does not show that the number of "infecting cases" at the Acute Hospitals is appreciably influenced, if influenced at all, by the transfer of patients to the Convalescent Hospitals, or that the patients transferred were specially selected.

When the evidence adduced in the previous section is taken into account, together with the fact that only 16 per cent. of the cases which suffered from a mucous discharge were transferred, it is obvious, that any result, other than that elicited by the enquiry, would have been unexpected.

V.

Acute v. Convalescent Hospitals.

A total of 10,818 scarlet fever patients was discharged from the Acute Hospitals; from the Convalescent Hospitals, the Northern and Gore Farm, 4,683; the average period of detention of the patients being 68 days at the last named hospitals, or five days longer than at the Acute Hospitals.

Patients were transferred to the Northern Hospital after an average detention in Acute Hospitals varying, from 18·7 at the North-Eastern Hospital, to 40 days at the Western Hospital.

Their further detention is shown in the following table, which does not, however, include the figures for Gore Farm, as transfers to this hospital ceased shortly after this investigation commenced.

TABLE 14.

(August, 1901, to July, 1902.)

Hospitals.	Average period of detention.	
	Acute Hospitals.	Northern Hospital.
North-Eastern ...	18·7	47·5
Fountain	37·3	26·0
North-Western ...	33·8	35·4
Western	40·0	36·6
South-Western ...	26·8	35·3
South-Eastern ...	30·7	39·3

When comparing the results of the Acute and Convalescent Hospitals, the type of case treated in these hospitals, and the age distribution of the discharges have to be considered. The larger the number of adults discharged, the smaller should be the number of "infecting cases. The figures on this point are given in the following table :—

Table 15.

Age periods.	Under 5	5 to 10	10 and over
Northern Hospital	20·38	45·67	33·94
Acute Hospitals	35·18	35·95	28·85

From which it will be seen, that at the Northern Hospital there are more patients over ten, and fewer under five years of age, but, on the other hand, there is a larger proportion of patients between five and ten years, which is the age period associated with the largest number of "infecting cases."

With regard to the type of case. If mucous cases be looked upon as the greatest source of infection, then the Convalescent Hospitals should provide the lowest number of "infecting cases," since, as already mentioned, only 16 per cent. of such cases were transferred. But even after making allowance for this, the following table shows that the results obtained from the Convalescent Hospitals compare favourably with those from the Acute Hospitals, both in connection with total discharges and for each period of detention, and more especially among those discharged after eight weeks.

Table showing for the Acute and Convalescent Hospitals the percentage of "infecting cases" among patients discharged at each of the following periods of detention. (See also Appendix, Table 23.)

Table 16.

Period of Detention.	Acute Hospitals.	Convalescent Hospitals.
Under 8 weeks ...	3·2	2·7
8–12 weeks ...	4·	2·7
12 weeks and over	3·6	·9
Total ...	3·6	2·4

VI.

The Average Period of detention since 1899.

Since 1899, when records for each hospital were first made, the average period of detention of patients at the Acute and Convalescent Hospitals, shows a decrease, of 7·8 days at the former and 9·9 days at the latter.

In 1900, there was a decrease on the records for the previous year of 1·8 days, at the Acute Hospitals, and at the Convalescent Hospitals, an increase of 2·6 days. In 1901 there was a decrease on the previous year, at the Acute and Convalescent Hospitals, of 6·1 and 5·3 days, respectively.

In 1902 at four of the Acute Hospitals there was an increase, and at five a decrease, on the previous year, the net average period of detention, remaining the same as in 1901.

At the Northern Hospital, however, there was a further reduction of 5·5 days.

Although, since 1899, nearly all the hospitals have had a lower average period of detention, the reduction has not been by any means uniform or continuous throughout.

In most of the hospitals when a decrease was shown in one year, an increase appeared in the next year, and, in some cases, in each of the two years following. Thus, at the North-Western Hospital there was, in 1900, a reduction of 5·3 days, followed by an increase in the next two years of 4·5 and 2·6 days, respectively.

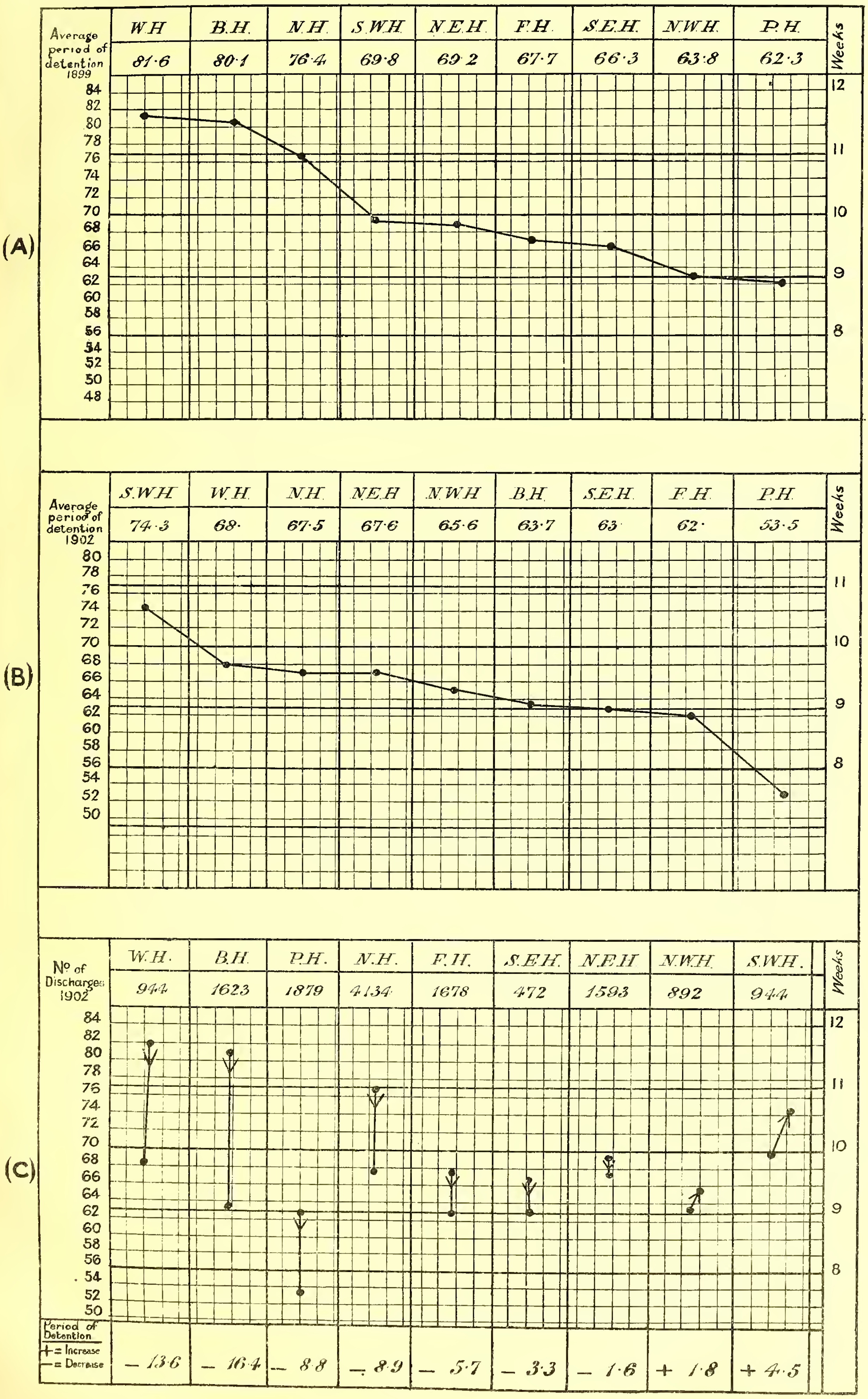
At the South-Eastern Hospital, in 1900, there was a decrease of 2·1 days; in the next year an increase of 3·3 days, and, in the last year, a decrease of 4·5 days.

The hospitals which are chiefly responsible for the reduction in the period of detention since 1899 are the Brook (16·4 days), the Western Hospital (13·6 days), the Northern (8·9 days), and the Park Hospital (8·8 days).

On referring to the accompanying Chart VIII. it will be observed that the general effect of the reduction in the period of detention is to bring those hospitals, which previously held conspicuous positions, more into line with the other hospitals. (See also Appendix, Table 24.)

CHART VIII.

CHARTS (A & B). Showing for each Hospital the average period of detention during 1899 and 1902 respectively.
CHART (C.) Showing for each Hospital the Increase or Decrease in the period of detention since 1899.



VII.

Clinical condition of "Infecting Cases" compared with "All Cases.

Table showing the condition present after the discharge of the alleged "infecting case," and the condition of "all cases," noted at the time of discharge.

TABLE 17.

(Period July 1901 to July 1902 inclusive.)

No. of Cases.	Morbid condition of Nose.			Morbid condition of the Throat.	Enlarged Glands.	Desquamation.	Affections of Skin and Scalp.	Otorrhœa.	Post Nasal discharge.	Cough.	Conjunctivitis.	Leucorrhœa.	Abscess.	Anal fissure.	Stomatitis.	Albuminuria.	No apparent morbid condition
	Purulent Rhinorrhoea.	Rhinitis	Non-Purulent Rhinorrhœa														
"Infecting cases" *(648)	121	121	96	209	145	94	94	54	23	17	9	2	5	3	4	1	125
													10				
Percentage	18·67	18·67	14·81	32·25	22·37	14·50	14·50	8·33	3·54	2·62	1·38		1·54		·61	·15	19·29
		52·31															
"All cases" (16,702)		593		1052	529	1361	274	361								68	12,860
Percentage		3·55		6·30	3·17	8·15	1·64	2·16								·41	77·

*Forty cases are omitted, of which thirty were cases of scarlet fever that occurred subsequent to the discharge of diphtheria cases, and in the remaining ten the information was either wanting or unreliable.

On contrasting the "infecting cases" and "all cases," it will be noticed that, while desquamation was the morbid condition most frequently present at the time of discharge, it was by no means the condition most commonly associated with the illness of "return cases," and that, whereas patients were, on comparatively few occasions, discharged with a morbid condition of the nose, yet it was present in more than half the alleged "infecting cases." On examining the table it will also be noticed that in every column the "infecting cases" had the higher percentages.

It was after their return home that many of the "infecting cases" first suffered from the morbid condition recorded. This was the case in twenty-one, out of fifty-four otorrhœa cases, and in over 60 per cent. of those that suffered from a morbid condition of the nose.

As it appeared more than probable that the occurrence of these morbid conditions for the first time after discharge was not peculiar to the "infecting case," 500 recovered cases of scarlet fever were examined in their homes, in order to ascertain to what extent these morbid conditions were capable of doing harm. The cases were taken without selection from the Office Registers, and the examination was made in each instance within a fortnight of the patient's discharge from hospital. Out of this number, twenty-two cases were associated with the illness of "return cases," and these have not been included in the following table, which gives the conditions present (*a*) at the time of discharge, and (*b*) after the discharge of the remaining 478 cases.

TABLE 18.

	Morbid condition of Nose			Morbid condition of Throat.	Enlarged Glands.	Otorrhœa.	Affections of Skin and Scalp.	Desquamation.	No apparent Morbid condition.
	Purulent Rhinorrhœa.	Rhinitis.	Non Purulent Rhinorrhœa.						
On discharge ...	7	5	10	7	1	8	1	38	418
		22							
After discharge ...	15	24	49	156	109	27	17	39	184
		88							

On examining the above table, it will be seen that, while only twenty-two cases suffered from a morbid condition of the nose at the time of discharge, it was present after discharge in eightyeight cases. Of these latter cases, 59, or about 67 per cent., suffered from this affection for the first time after discharge, a result which is practically the same as that observed among the “infecting cases.”

In the following table these cases and the “infecting cases” are compared.

TABLE 19.

Showing the condition present after discharge of “infecting cases,” as compared with that of “all cases.”

No. of Cases.	Morbid condition of Nose.			Morbid condition of Throat.	Enlarged Glands.	Desquamation.	Affections of Skin and Scalp.	Otorrhœa.	Post Nasal Discharge.	Cough.	Conjunctivitis.	Leucorrhœa. Abscess. Anal Fissure.	Stomatitis.	Albuminuria.	No apparent Morbid Condition.
	Purulent Rhinorrhœa	Rhinitis.	Non Purulent Rhinorrhœa.												
“Infecting Cases” (648)	121	121	96	209	145	94	94	54	23	17	9	2 5 3	4	1	125
Percentage ...	18·67	18·67	14·81	32·25	22·37	14·50	14·50	8·33	3·54	2·62	1·38	1·54	·61	·01	19·29
		52·3													
Non “Infecting Cases” (478)	15	24	49	156	109	39	17	27	...	...	...	...	...	..	184
Percentage ...	3·1	5·	10·2	32·6	22·8	8·1	3·5	5·6	...	...	...	...	...	...	38·4
		18·4													

“All Cases.”—Period, August 1st to 14th November, 1903.

“Infecting Cases.”—Period, July 1901 to July 1902.

The most noticeable feature in this table is the frequency with which “infecting cases” as compared with “non-infecting cases” suffered from morbid affections of the nose. It will also be observed, that, while in the majority of the “infecting cases” the discharge from the nose was purulent or rhinitis was present, in more than half of the “all cases” the discharge was non-purulent.

It will further be noticed, that in the columns devoted to cases of non-purulent rhinorrhœa, the percentage in each group is about the same. So that, while a morbid condition of the nose may be closely associated with, or be the actual cause of “return cases,” the non-purulent discharge does not appear to be so infectious as the other nasal affections.

In the three columns, headed respectively, “morbid condition of the throat,” “enlarged glands” and “otorrhœa,” the percentage in each group is the same, which I take as evidence that these lesions are of secondary importance in causing “return cases.”

Under “Desquamation” and “Affections of Skin and Scalp,” the proportion of “infecting cases” is much higher. In the case of desquamation, I believe this is chiefly due to the fact that the observations in each case were not made by the same person, and that, while, on the one hand, all lesions of the skin, such as broken skin on the feet, or any suspicious deviation from the normal condition were noted; on the other, desquamation was only recorded when there was some definite evidence of scarlet fever peeling.

Those cases appearing in the column headed “Affections of the Skin and Scalp,” will be dealt with later. I may, however, say here, that in a very large proportion a morbid condition of the nose existed as well.

Turning now to the 22 “infecting cases,” which arose among the 500 discharges, the following table shows that 13 of the them were subsequent to the discharge of 227 complicated cases and 9 subsequent to the discharge of 273 uncomplicated cases, equivalent to 5·7 and 3·2 per cent., respectively.

TABLE 20.

	Cases.	Infecting Cases.	Percentage.	Infecting cases. Average detention.
Complicated (in hospital) ...	227	13	5·72	65
Uncomplicated (in hospital) ...	273	9	3·29	48

The following list provides further details in connection with these "Infecting Cases."

No.	Condition on Discharge	Condition after Discharge	Complications in Hospital	Period of Detention
1	Nil	Rhinorrhœa and enlarged Tonsils and Glands	Rhinorrhœa	64
2	Nil	Rhinitis	do.	115
3	Desquamation	Tonsils enlarged and Desquamation	Nil	48
4	Nil	Adenoids, Glands enlarged	Nil	45
5	Rhinitis	Rhinitis	Rhinorrhœa and Otorrhœa...	70
6	Nil	Desquamation	Nil	53
7	Nil	Adenoids	Albuminuria	45
8	Nil	Glands enlarged ...	Nil	40
9	Rhinitis	Adenoids and enlarged Glands, Rhinitis	Albuminuria and Rhinitis	73
10	Nil	Tonsils enlarged and Desquamation	Nil	46
11	Nil	Rhinorrhœa and Otorrhœa	Otorrhœa	64
12	Desquamation	Rhinitis and Desquamation	Albuminuria	43
13	Nil	Post Nasal Discharge	Nil	40
14	Nil	Rhinitis	Nil	66
15	Nil	Otorrhœa and enlarged Tonsils	Otorrhœa and Nephritis	74
16	Nil	Rhinitis and enlarged Tonsils	Otorrhœa and Nephritis	96
17	Nil	Rhinitis	Measles	52
18	Nil	Rhinorrhœa	Rhinorrhœa and Tonsillitis	48
19	Nil	Tonsils enlarged ...	Tonsillitis	60
20	Nil	Adenitis	Nil	52
21	Nil	Rhinitis	Nil	41
22	Nil	Glands enlarged ...	Nephritis	47

On examining the above list and contrasting it with Table 18 it will be seen that it was not, as might have been expected, those cases which were suffering from a morbid condition of the nose, at the time of their discharge, that were associated with the illness of the "return cases," but the "Nil" on discharge cases. Of these there were eighteen, in ten of which the complications occurred in hospital, and in four others after returning home. The remaining four cases, Nos. 4, 6, 8 and 10, are shown in the list.

The number of cases dealt with here is small, but they serve as additional evidence to show that apart from the condition of the patient at the time of discharge, the potentiality of a patient to cause a "return case" is increased should he suffer from complications in hospital.

Infecting Cases.] In the following table each morbid condition of the 648 "infecting cases" shown in Table 17, is taken separately, and the co-existing affections are recorded. [TABLE 21.

	Morbid condition of the Nose.			Morbid condition of the Throat.	Post Nasal Catarrh.	Enlarged Glands.	Desquamation.	Affections of the Skin and Scalp.	Otorrhœa.	Conjunctivitis.	Cough.	Stomatitis.	Leucorrhœa and Abscess.	No other apparent Morbid condition.
	Purulent Rhinorrhœa.	Rhinitis.	Nasal Catarrh or Non-Purulent Rhinorrhœa.											
Rhinorrhœa—														
No. of Cases (121)	..	..	..	41	2	30	11	20	20	1	1	1	1	45
Percentage	..	..	..	33·88	1·65	24·79	9·09	16·52	16·52	..	..	..	..	37·19
Rhinitis—														
No. of Cases (121)	..	..	..	36	9	32	17	14	10	1	1	..	1	45
Percentage	..	..	..	29·75	7·43	26·44	14·04	11·57	8·26	..	..	..	..	37·19
Nasal Catarrh—														
No. of Cases (96)	..	..	..	43	4	35	16	19	3	2	4	1	..	24
Percentage	..	..	..	44·79	4·1	36·45	11·45	19·79	3·12	..	..	..	..	25·
Total (338)	..	..	..	120	15	97	44	53	33	4	6	2	2	114
Percentage	..	..	..	35·50	4·43	28·69	13·01	15·68	9·76	1·18	1·77	·59	·59	33·72
Morbid condition of Throat—														
No. of Cases (209)	41	36	43	..	18	83	27	31	15	3	8	1	..	36
Percentage	19·61	17·22	20·57	..	8·61	39·71	12·91	14·83	7·12	..	3·82	..	..	17·22
		57·40												
Enlarged Glands—														
No. of Cases (145)	20	32	35	83	8	..	22	30	9	2	4	1	2	7
Percentage	13·79	22·06	24·13	57·2	5·5	..	15·1	20·68	6·2	..	2·7	..	..	4·9
		60·												
Desquamation—														
No. of Cases (94)	11	17	16	27	6	22	..	15	6	2	..	..	..	24
Percentage	11·69	18·	17·	28·61	6·37	23·4	..	15·9	6·38	..	..	..	..	24·14
		46·69												
Affection of Skin and Scalp—														
No. of Cases (94)	20	14	19	31	1	30	15	..	12	1	6	2	2	12
Percentage	21·27	14·8	20·21	32·9	1·	31·91	15·9	..	12·7	..	6·3	..	..	12·7
		56·38												
Otorrhœa—														
No. of Cases (54)	20	10	3	15	1	9	6	12	..	1	..	1	..	10
Percentage	37·02	18·51	5·55	27·77	1·	16·66	11·11	22·22	..	..	..	..	..	18·5
		61·11												

Co-existing morbid affections.—Two thirds of the alleged "infecting cases" suffered from more than one morbid condition, and, on examining Table 21, it will further be noticed that, whereas in 33·7 per cent. of the cases that suffered from a morbid condition of the nose there was no other affection, yet of 145 cases suffering from enlarged glands 7 only were uncomplicated. Otorrhœa cases were also frequently complicated with other affections, this being so in 44 out of 54 such cases.

Morbid condition of the Nose.—Over 50 per cent. of the total number of "infecting cases," and 75 per cent. of those in the Group "A" sub-division, (see Tables 25 and 26 in appendix) suffered from a morbid condition of the nose, and this affection co-existed also, in 60 per cent. of the cases that suffered from enlarged glands, and in 61 per cent. of those suffering from otorrhœa.

In addition it was present in 56 per cent. of the cases that suffered from affections of the skin or scalp, in 57 per cent. of those suffering from a morbid condition of the throat, and in 46·6 per cent. of those grouped under "Desquamation." A morbid condition of the nose was therefore fairly equally distributed

Purulent Rhinorrhœa Cases.—In most of the cases that suffered from a purulent rhinorrhœa the discharge ran freely, but occasionally it was only to be seen when the handkerchief was used, or when the patient coughed or sneezed.

In over 50 per cent. of the cases, this affection was first observed after the patient left the hospital.

Rhinitis Cases.—In a little over 70 per cent. of the rhinitis cases, the anterior nares was either excoriated, or there was a fissure at the junction of the skin and mucous membrane from which a thin watery discharge oozed. In 20 per cent. of these cases either the mucous membrane appeared swollen, or the patient complained that it was "blocked" or "stuffy." In a few cases the septum was injected, and on it thin crusts had formed. In other cases there was no morbid condition to be seen, but frequently the nose was tender.

Non Purulent Rhinorrhœa.—In 31 per cent. of the cases that suffered from non-purulent rhinorrhœa, there was a previous history of rhinorrhœa in hospital, and the watery discharge was, in all probability, a late stage of this affection. In other cases, the watery discharge appeared for the first time after the return home of the patient, and was indistinguishable from any ordinary cold.

More frequently than rhinorrhœa and rhinitis cases, these patients suffered from adenoids, and a general morbid condition of the throat, and apparently they were not so infectious, as will be seen in the following table, where these cases are subdivided into the three groups, A, B and C, to show their relative infectiousness.

Table 22.

Classification.	A.	B.	C.
Purulent Rhinorrhœa Cases (121) ...	79·3	2·4	18·1
Rhinitis Cases (121)	57·	5·7	37·1
Non Purulent Rhinorrhœa Cases (96)	47·9	16·6	35·4

The following table gives the period of detention of the cases that suffered from purulent rhinorrhœa, and also of such cases grouped in the last table under "A," and from this it will be seen that an almost equal proportion of the cases discharged at each of the three periods of detention was placed in the "A" group.

Table 23.

Period of detention.	Under 8 weeks.	8 to 12 weeks.	12 weeks and over.
Purulent Rhinorrhœa Cases (121)...	29·7	51·2	19·
Ditto "A" cases (96)	27·	54·1	18·7

It will also be noticed on contrasting these cases with "all cases" in the next table that the largest proportion was discharged after a detention of over 8 weeks, and that the patients detained from 8 to 12 weeks, and for 12 weeks and over were associated with an almost equal proportion of "infecting cases." (See also Appendix, Table 29.)

TABLE 24.

Period of detention.	Under 8 weeks.	8 to 12 weeks.	12 weeks and over.
"All cases"	39·6	44·6	15·6
Purulent rhinorrhœa cases (121) ...	29·7	51·2	19·

Otorrhœa cases.—During the period covered by this report, 361 patients were sent out of hospital, suffering at the time of discharge from otorrhœa, and of these, only 33 cases were associated with the illness of "return cases." Out of the 361 patients, about one-third, namely, 123 cases, were discharged from the Park Hospital.

The period of detention of the latter is shown in the following table:—

TABLE 25.
(July, 1901, to July, 1902.)

Period of detention.	Under 8 weeks.	8 to 12 weeks.	12 weeks and over.
No. of cases (123)	36	61	26

Of the 123 cases, only 8 were, subsequent to their discharge, associated with the illness of "return cases," and in all of these, a morbid condition of the nose co-existed, in two while the patients were still in hospital, and in the remaining 6 cases, after discharge. One case was detained in hospital less than 8 weeks, 3 for a period of from 8 to 12 weeks, and 4 for 12 weeks and over.

There were in all 54 otorrhœa infecting cases, in 21 of which, as previously stated, the discharge came on for the first time after leaving hospital.

Relatively to the proportion of "all cases," it will be seen from the following table that the largest proportion of the 54 cases was detained for a period of 12 weeks and over, and, from Table 27, that the cases which occurred for the first time after discharge, were chiefly patients detained 8 to 12 weeks. The figures on this point are as follows (see also Appendix, Tables 30 to 32):—

TABLE 26.

Period of detention.	Under 8 weeks.	8 to 12 weeks.	12 weeks and over.
"All cases"	39·6	44·6	15·6
"Otorrhœa cases" (54)	16·6	46·2	37·

TABLE 27.

Period of detention.	Under 8 weeks.	8 to 12 weeks.	12 weeks and over.
"All cases"	39·6	44·6	15·6
"Otorrhœa cases" (21)	33·3	62·	4·7

Although the evidence adduced from these tables tends to show that patients who suffer from otorrhœa do not, as a rule, cause "return cases," nevertheless a large proportion of the "infecting cases" in which this morbid condition was present, was apparently the cause of the "return cases." This, I believe, was chiefly due to the fact that other morbid affections co-existed.

The following statement gives the proportion located to each group.

TABLE 28.

Classification.	Infecting Cases that suffered from Otorrhœa. A.	B	C.
No. of Cases (54)...	35	7	12
Percentage ...	64·8	12·9	22·

It is also interesting to note that the majority of the "A" cases—were discharged after 8 to 12 weeks' detention, a period which corresponds to that at which most rhinorrhœa cases were discharged. This is shown in the following table (see Appendix, Table 29) :—

TABLE 29.

Period of Detention.	Under 8 weeks.	8 to 12 weeks.	12 wks. and over.
Otorrhœa "All Cases" (54).	16·6	46·2	37·
Otorrhœa "'A' Cases" (35).	14·2	51·4	34·

Desquamation.—Reference to Table 17 will show that 1361 patients were discharged from hospital during thirteen months with some evidence of desquamation, (chiefly confined to the feet), and that, during the same period, in only 94 cases (or 14·5 per cent. of the total "infecting cases,") associated with the illness of those "return cases" was desquamation found. In the majority of these "infecting cases," another morbid condition co-existed, which was sufficient in most cases to account for the illness of the "return case." For instance, in 54 cases a morbid condition of the nose was also present, in six there was a post-nasal discharge, in six otorrhœa, in fourteen some other miscellaneous complication, such as enlarged glands, or a morbid condition of the throat, and in only 24 cases was desquamation alone present. On the other hand it will be seen that there were 125 "infecting cases," equivalent to 19·2 per cent. of the total, in which no morbid condition was apparently present. So that, whatever may be said of the early desquamation, the evidence adduced from these cases would seem to show that the late desquamation is not infectious.

In the following table the relative infectiousness of these cases is shown; but, as the number of desquamating cases is very small, the results must, consequently, be accepted with caution.

TABLE 30.

Classification.	No. of cases.	A.	B.	C.
No Morbid condition...	125	11	66	48
Desquamation only ...	24	8	7	9

The period of detention of the cases in the two sub-divisions A and C is as follows :—

TABLE 31.

Period of Detention.	No Morbid condition.		Desquamation.	
	A.	C.	A.	C.
Under 8 weeks	5	22	5	5
8 weeks and over ...	6	26	3	4

Affections of Skin and Scalp.—As many as 60 per cent. of the "infecting cases" in this column suffered from impetigo, chiefly on the face, and eczema auris. In the majority a mucous discharge or rhinitis was also present. In other cases, although no morbid condition could be detected, there was a history of rhinorrhœa in hospital, and occasionally the impetigo, which preceded the discharge by a day or two, was the first indication that the nose was in a morbid condition.

If the periods be compared of the detention of the "infecting cases," which are grouped in the following table, according to the condition prevailing after discharge, it will be seen that the desquamation cases and the cases with no apparent morbid condition were detained the shortest time, while the rhinorrhœa and otorrhœa cases were detained the longest.

TABLE 32.

Period of Detention.	Under 8 weeks.	8 to 12 weeks.	12 wks. and over.	Average period of detention (in days).
"All Cases"...	39·66	44·67	15·66	64·57
"Desquamation"	44·69	50·	5·31	58·38
"No Morbid Condition"	46·40	49·60	4·	59·35
"Morbid condition of the Throat"...	36·36	49·76	13·87	64·70
"Rhinorrhœa"	29·75	51·53	19·	67·43
"Otorrhœa"...	16·66	46·29	37·03	77·3

And, if these cases be contrasted with the "all cases," shown in the table, it will be further noticed, that, whereas an almost equal proportion of the cases grouped under "morbid condition of the throat," was discharged at each of the three periods of detention, the largest proportion of the cases in the two groups first named was discharged under twelve weeks, and an unduly large proportion in the last two groups, after eight weeks. The net result of this comparison indicates that, although the period of detention varies in the several groups, from 58 to 77 days, the total averaged 63·5 days.

Briefly then, the most important facts elicited from these tables are :—

(1.) That a morbid condition of the nose was the lesion most commonly associated with the illness of "return cases."

(2.) That, although desquamation was the morbid condition most frequently present at the time of discharge, it was comparatively seldom associated with the illness of "return cases;" the evidence, therefore, fails to support the assumption that this late peeling is infectious.

(3.) That, except when other morbid conditions co-existed, patients who suffered from otorrhœa did not, as a rule, cause "return cases."

(4.) That cases in which no morbid condition could be detected, might yet be infectious.

(5.) That apart from the condition on discharge, patients who suffered from complications in hospital, were more prone than uncomplicated cases to cause "return cases."

VIII.

The Seasonal Incidence of "Return Cases.'

The 1901-2 epidemic began in April, 1901, and from that date until the latter half of the following October, the number of patients under treatment gradually rose. In November a decrease in the numbers began and continued until April, when the minimum number of patients under treatment was reached.

"Infecting cases" and, consequently, "return cases" occurred in every month of the year, but in November the numbers increased somewhat rapidly, beyond those for previous months and remained high until after April, notwithstanding the decline in the number of patients under treatment, as shown in Chart IV. and the following tables:—

Table 33.

Month.	No. of Patients Discharged.	No. of Infecting Cases.	Percentage of Infecting Cases on Discharges	Average period of detention in days ("All Cases.")	Average period of detention "Infecting Cases."
July, '01 ...	1201	35	2·9	...	...
August ...	1275	39	3·	66·12	66·44
September ...	1502	40	2·6	68·81	64·92
October ...	1538	55	3·5	64·27	60·07
November ...	1582	85	5·3	59·60	59·75
December ...	1322	83	6·2	59·23	61·77
January, '02 ...	1633	74	4·5	66·97	61·84
February ...	1110	57	5·1	69·30	69·07
March... ...	1232	58	4·7	69·05	65·41
April	975	45	4·6	67·02	63·60
May	1089	38	3·4	64·30	76·13
June	939	31	3·3	64·29	59·83
July	1304	48	3·6	58·	59·66

QUARTERLY RETURN.

TABLE 34.

Period.	Discharges.	Percentage of Infecting Cases on Discharges.	Period of detention in days ("All Cases.")	Period of detention ("Infecting Cases.")
August to October, '01				
No. of Cases	4315	3·1	66·41	63·36
November, '01 *to January*, '02				
No. of Cases	4537	5·3	62·14	61·07
February to April, '02				
No. of Cases	3317	4·8	68·53	66·19
May to July, '02				
No. of Cases	3332	3·5	61·56	64·91
Total	15,501	4·1	64·57	63·51

On examining the table further it will be observed that the increase in the number of "infecting cases" cannot be due to a reduction in the period of detention, and it cannot be argued that it is due to any laxity of vigilance in connection with the discharge of patients, since it will be seen that the increase does not occur at the period of maximum discharges, at which time the strain, if any, on the administration would be greatest. (See also Appendix, Tables 40 and 42.)

That it may depend on overcrowding or increased aggregation of patients has been suggested, but it must be remembered that the "infecting cases" showed no tendency to decline with the number of patients under treatment, whilst the figures on this point as shown in the following table, also point to the opposite conclusion.

TABLE 35.

Period.	Daily average No. of Patients under treatment.	"Infecting cases." Percentage on discharge.
August to October, 1901 ...	3119	3·1
November to January, 1902 ...	3026	5·3
February ,, April, ,, ...	2215	4·8
,, July, ,, ...	2297	3·5

That it is not a mere coincidence dependent on outside sources of infection, is proved by the fact that the largest number of "infecting cases" occurred at the time of least epidemic prevalence, and it is also interesting to note that the converse holds good. (See Table 3 in the Appendix.) It may, however, be due to some difference in the type of case treated during these months, and, if this be so, there should be a corresponding increase in the number of cases that suffered from mucous discharge, for these are the patients that are most frequently associated with the illness of "return cases."

To enquire into this point I have prepared the following tables which give in monthly, quarterly, and half-yearly periods, the number of cases that suffered from mucous discharges.

TABLE 36.

Showing the number and percentage of cases of Mucous Discharges transferred to the Convalescent Hospitals and discharged from the Acute Hospitals each month.

Month.	Transfers to Convalescent Hospitals.	Discharges from Acute Hospitals.	Transfers that suffered from Mucous Discharge.	Discharges that suffered or had previously suffered from Mucous Discharge.	Percentage of Transfers that suffered or had previously suffered from Mucous Discharge.	Percentage of Discharges that suffered or had previously suffered from Mucous Discharge.
August, 1901	604	732	33	64	5·4	8·7
September	397	911	42	121	10·5	13·2
October	675	942	47	119	6·9	12·6
November	557	974	29	100	5·2	10·2
December	408	903	10	110	2·4	12·1
January, 1902	106	1062	1	122	·94	11·4
February	58	925	1	132	1·7	14·2
March	...	1139	...	135	...	11·8
April	335	934	28	129	8·3	13·8
May	358	810	19	115	5·3	14·1
June	366	645	19	114	5·1	17·6
July	493	841	22	113	4·4	13·4
	4357	10818	251	1374	5·7	12·7

TABLE 37.

Quarterly and Half Yearly return of the above.

Month.	Transfers to the Convalescent Hospitals.	Discharges from the Acute Hospitals.	Transfers that suffered from Mucous Discharge.	Discharges from Acute Hospitals that suffered from Mucous Discharge.	Percentage of Transfers.	Percentage of Discharges.
August to October '01...	1676	2585	122	304	7·2	11·7
November to January '02	1071	2939	40	332	3·7	11·2
February to April '02 ...	393	2998	29	396	7·3	13·2
May to July '02 ...	1217	2296	60	342	4·9	14·8
Aug. '01 to Jan. '02 ...	2747	5524	162	636	5·8	11·3
Feb. to July '02 ...	1610	5294	89	738	5·5	13·9

Only those cases are included in this table, in which the mucous discharge continued intermittently, or otherwise, for a period of at least one month.

It will be seen that 12·7 per cent. of the patients discharged from the Acute Hospitals, during the twelve months ending July, 1902, suffered, while in hospital, from a discharge either from the nose or ears. It will also be perceived that the number of mucous cases discharged each month, approximated fairly closely to the average, although in the last six months the proportion was rather larger, viz: 13·9 per cent., as against 11·3 per cent., in the first six months. This cannot, however, be attributed to the transfer of fewer mucous cases to the Convalescent Hospital, for, in the first and second half-yearly periods, as shown in this table, the proportion of mucous cases transferred was 5·8 and 5·5 per cent., respectively. And again, the Park, Brook, and Fountain Hospitals, which only transferred a few cases, furnish results of a similar nature, except that the increase in the last six months was even more marked, viz: 10·8 per cent. from August to January, and 15 per cent. from February to July. Again, if the results of the Convalescent Hospitals be also taken into account, it will be seen from the following table, that the proportion of mucous cases discharged at each period of detention is about the same.

Cases that suffered from Mucous Discharge while in hospital.

TABLE 38.

	August to October, 1901.	November to January, 1902.	February to April.	May to July.
Percentage on "all cases" discharged	10·59	8·75	10·18	11·10

There is, therefore, no evidence to show that the type of case treated, during the months from November to April, is responsible for the larger number of "infecting cases" during this period. Though this may be the case, yet from the fact that it is after leaving hospital that so many patients suffer, for the first time, from mucous discharge, and that the somewhat sudden increase in the number of "infecting cases," coincides with the commencement of the cold weather, it occurred to me that the climatic conditions which obtain during the winter and months of early spring may have an important bearing on the number of these cases, and the evidence in support of this theory is most interesting.

Within two days after leaving hospital, 187 "infecting cases" suffered from a mucous discharge, the proportion that occurred in each quarter being shown in the following table:—

"Infecting Cases" which suffered from Mucous Discharge, within two days after leaving hospital. (See also Appendix, pages 74 and 75.)

TABLE 39.

	August to October, 1901.	November to January, 1902.	February to April.	May to July.
Percentage on "all cases" discharged ...	·85	1·49	1·77	·69

Since the "infecting cases" which suffered from a mucous discharge were twice as frequent during the months from November to April, inclusive, as they were for the months from May to October, it is probable that this accounts for the higher incidence of "infecting cases" during the period.

IX.

Age Distribution of "Infecting Cases."

The following table shows the age distribution of "infecting cases" as compared with "all cases":—

TABLE 40.

(July, 1901, to July, 1902.)

Age period.	0—5 years.	5—10 years.	10 years and over.
"All cases" (15,501) discharges	30·71	38·89	30·39
"Infecting cases" (648) ...	32·71	47·37	19·90

It will be seen that at ages up to 5 years, the proportion of "infecting cases" is about the same as "all cases," and, while an unduly large proportion of "infecting cases" occur among patients between 5 and 10 years of age, that for patients of 10 years and over is equally smaller.

The table, therefore, shows that at 5-10 years patients are more prone to cause "return cases" than at any other age, but after 10 years, this tendency is much lessened. As a matter of fact, adults are comparatively rarely associated with the illness of "return cases." (Table 34A, Appendix.)

In the following table the "infecting cases" are sub-divided, as in a previous table, according to the conditions present after discharge, and the age distribution of each group; the total number of "infecting cases" is also shown. (See Appendix, page 69.)

TABLE 41.

Age Period.	Under 5 Years.	5 to 10 Years.	10 years and over.
All "Infecting Cases" (648)	32·7	47·3	19·9
Morbid condition of the Nose (338) ...	36·3	50·2	13·3
Morbid condition of the Throat (209) ...	36·3	48·8	14·8
Desquamation (94)	26·5	43·6	29·7
Otorrhœa (54)	57·4	40·7	1·8

On contrasting each sub-division with the total number of "infecting cases," it will be seen that the "morbid condition of the nose" group has the largest proportion of "infecting cases" in the 5-10 years age period, the "Desquamation' group at 10 years and over, and the "Otorrhœa" group at ages from 0-5, so that the "Morbid condition of the Nose" group is chiefly responsible for the unduly large number of "infecting cases," between the ages of 5-10.

If the "infecting cases" in this group be compared with "all cases," it will be found that the disproportionate number of "infecting cases" at ages of from 5-10 years is even more marked, and that comparatively few "infecting cases" at 10 years and over suffered from nasal affections.

The figures relating to this point are as follows :—

TABLE 42.

Age Period.	Under 5 years.	5 to 10 Years.	10 Years and over.
"All Cases" (15,501) discharges ...	30·71	38·89	30·39
"Infecting Cases," Morbid condition of the Nose (338)	36·39	50·29	13·31

With regard to the desquamation cases, I believe I am correct in saying, that in the majority of "all cases" discharged with peeling, the patients are over 10 years of age, which would account for the larger number of "infecting cases," at this period.

In the case of otorrhœa, if these "infecting cases" be contrasted with the "all cases" discharged from the Park Hospital with this lesion present at the time of discharge, then the following table shows that, although the largest number of discharged patients who suffered from otorrhœa were under 5 years of age, the patients at ages of from 5-10 years were more frequently associated with "return cases." It will also be noticed that the small number of "infecting cases" in the age period of 10 years and over, is conspicuous. (See Appendix, page 76.)

TABLE 43.

Age period	Under 5 years	5 to 10 years	10 years and over
"Otorrhœa Cases" (discharged from the Park Hospital). (123)	63·4	30·0	6·5
"Infecting Cases" (54)	57·4	40·7	1·8

These statistics suggest that some other morbid condition, co-existing with the otorrhœa cases, is responsible for its special incidence in the 5-10 age period. The frequency with which otorrhœa infecting cases, occur with a morbid condition of the nose points to this lesion, and the evidence is strengthened by the fact that the largest proportion of the "infecting cases" that come under the latter heading are patients from 5-10 years.

These facts I accept as additional evidence tending to show that otorrhœa discharges are not infectious *per se*, otherwise the "infecting cases" would have been more equally distributed.

Summary.—An analysis of the tables in this section brings out the following facts:—

(1.) That, between the ages of 5-10 years, patients are more prone to cause "return cases" than at any other age.

(2.) That, at ages from 5-10 years, an unduly large proportion of "infecting cases" suffered from a morbid condition of the nose.

(3.) That, although the largest proportion of patients discharged with otorrhœa are under 5 years of age, at ages of from 5 to 10 years, a relatively larger number of such cases are associated with the illness of "return cases."

X.

Age Distribution of "Return Cases."

Table showing the age distribution of "return cases" as compared with "all cases":—

TABLE 44.

(July, 1901, to July, 1902.)

Age period.	0—5 years.	5 to 10 years.	10 years and over.
"All cases" admissions	32·05	38·28	29·66
Return cases*(930) ...	38·17	36·34	25·48

Contrasting the figures shown in the above table, it will be seen that the largest number of "return cases" were patients under 5 years of age. This, I shall endeavour to explain, is due to the fact that at this age period the attack rate was higher, and, secondly, that after the return of the "infecting case" there were more susceptible children exposed to attack.

In the following table are given the ages of the susceptible children in 620 families where investigations were made, and the number attacked (*a*) before, and (*b*) after the discharge of the alleged "infecting case." (For further particulars see Appendix, Table 51.)

TABLE 45.

Age period.	0—5 years.	5—10 years.	10 years and over.	Total.
Susceptible children	967	893	722	2,582
Children attacked before return of "infecting case"	244	341	152	737
(Primary and secondary cases.) ...	25·2	38·1	21·	28·5
Susceptible children not attacked before discharge of "infecting case."	723	552	570	1,845
Attacked after return of "infecting case"	345	317	190	852
("Return cases.")	47·7	57·4	35·	46·1

Before the discharge of the "infecting case," 737 or 28·5 per cent. of the susceptible children were infected with scarlet fever. Of these, 620 were subsequently alleged "infecting cases," 74 were cases attacked at the same time, and 43 during the time the "infecting cases were still in hospital.

On the return of the "infecting case," 852, or 46·1 per cent., of the remaining susceptible children, were infected, an increase on the primary outbreak of 62 per cent., that is, nearly two-thirds as many more children were attacked after as before the return of the "infecting case."

On referring again to the table it will be further noticed, that at the time of the return of the "infecting cases," there were more susceptible children of ages from 0-5 years than in the next age period, and that, although the attack rate in the former period was only 47·7 per cent., as compared with 57·4 per cent. in the latter period, the number of cases attacked under 5 years was greater by 28.

If the proportions of susceptible children attacked before and after the return of the "infecting case," be now compared, it will be seen from the following table that, although the attack rate was increased in each age period, the greatest was at ages under 5 years, and the smallest in the next quinquennium :—

Table 46.

Age period.	Under years.	5 to 10 years.	10 years and over.
Before discharge...	25·2	38·1	21·
After discharge ...	47·7	57·4	35·
Increase	89·2	50·6	66·6

XI.

Case Mortality of "Return Cases."

During the period covered by this enquiry, the mortality of "all cases" was 3·6 per cent., and of "return cases," 5·8 per cent., an increase, therefore, of 61 per cent.

This increase affected all ages, as will be seen in the next table, which also shows that the excess in mortality increased with the age of the patient :—

Table 47.

Age period.	Under 5 years.	5 to 10 years.	10 years and over.	Total.
"All cases"	7·6	2·1	1·2	3·6
"Return cases"	10·7	3·2	2·1	5·8
The increase	40·7	52·3	75·	61·1

There were 930 "return cases" admitted to hospital, of which, 25 or 2·6 per cent., were dangerously ill on admission ; 76 or 8·1 per cent., within the first week, and 9·3 per cent. within a fortnight, the total number being 117, equivalent to 12·5 per cent. of all the "return cases."

"D.N. 'return cases,'" that is "return cases" which were dangerously ill either on, or after, admission, or died while in hospital, occurred in all months of the year, but the following table does not suggest that the "infecting cases" were more virulent at one season than at another.

TABLE 48.

Months in which the "Return Cases" were admitted to Hospital.	"Return Cases."	"D.N." "Return Cases."	Percentage.
July, 1901	36	6	16·6
August	43	10	23·2
September	66	8	12·1
October	61	8	13·1
November	105	10	9·5
December	119	15	12·6
January, 1902	110	14	12·7
February	84	11	13·
March	86	9	10·
April	63	9	14·2
May	60	9	15·
June...	46	4	8·6
July	51	4	7·8
TOTAL	930	117	12·5

The period of detention of the "infecting cases," and the number of these cases that, subsequent to discharge, were associated with the illness of the "D.N. 'return cases'" is given in the following tables:—

TABLE 49.

Period of Detention.	Under 8 weeks.	8 to 12 weeks.	12 weeks and over.
"Infecting Cases" ...	253	322	78
"D.N. 'Infecting Cases'"	37	58	13
Percentage on above ...	14·6	18·	16·6

TABLE 50.

Period of Detention.	Under 10 weeks.	10 weeks and over.
"Infecting Cases"	463	190
"D.N. 'Infecting Cases'" ...	78	30
Percentage	16·8	15·7

The above tables show that the "infecting cases" discharged between 8 and 12 weeks were associated with the largest number of "D.N. cases," while those discharged under 8 weeks were associated with the fewest, and further that the "infecting cases" discharged under 10 weeks, and after a detention of 10 weeks and over, had almost the same proportion of "D.N. cases."

In the previous section it has been shown that the patients discharged after a detention of 8 weeks and over, were more prone to cause "return cases," than those discharged earlier, but that the longer these cases were detained, the more favourable were the results. The evidence therefore adduced in the tables therefore leads me to believe that, not only do the complicated cases retain their infection longer than the uncomplicated, but that they are more virulent, and that the effect of increasing the period of detention is to diminish both the infectiousness of the disease and the virulence of the infection. Further details of the tables in this section are shown in the Appendix, pages 79 to 82.

XII.

Superadded Diseases.

The scope of these investigations does not include an enquiry into all the causes and conditions which tend to prolong the period of detention of patients in hospital, but the following facts, which I have ascertained with regard to superadded infectious diseases, will, I believe, be sufficient to show that the long detention is partly due to the number of cases that suffer from superadded infections, which they either were incubating at the time of admission, or contracted subsequently.

It will be seen, on referring to the following table, that, during the twelve months ending July 1902, 229, or 1·15 per cent., of the scarlet fever patients admitted, were, at the time of admission, incubating another infectious disease, and it will also be noticed that, during their stay in hospital, 1,011 patients, equal to 5 per cent. on the total scarlet fever admissions, and 6·5 per cent. on the discharges, contracted another infectious disease.

Table showing, for each hospital, the number of cases that contracted a superadded infectious disease after admission, and their average period of detention, together with the number of cases that were incubating an infectious disease on admission, other than the one for which they were admitted :—

(Percentage on the total admissions).

TABLE 51.

(August, 1901, to July, 1902.)

Hospital.	Admissions. (Scarlet Fever.)	Superadded disease contracted in Hospital.	Percentage on admissions.	Average period of detention. (Recovered cases.)	Superadded disease incubating on admission.	Percentage on admissions.
Eastern	188	9	4·78	104·3	25	13·29
South-Eastern ...	929	36	3·87	73·2	10	1·07
North-Eastern ...	2764	97	3·50	89·9	39	1·41
Western	1378	86	6·24	94·9	27	1·95
South-Western ...	1249	83	6·64	106·3	17	1·36
North-Western ...	2424	108	4·45	74·6	26	1·07
Park	2263	179	7·90	75·8	33	1·45
Brook	1745	49	2·80	90·1	39	2·23
Grove	133	1	·75	66·	—	—
Fountain	2489	134	5·38	74·6	13	·52
Gore Farm	320	11	3·43	89·8	5	1·59
Northern	4031	218	5·40	107·4	28	·69
Total	19,913	1,011	5·07	89·7	229	1·15

The average period of detention of these cases was 89·7 days, as compared with 64·5 days for "all cases," or nearly a month longer.

Acute Hospitals.—At the Acute Hospitals the number of cases that contracted one or more of these diseases, varied from 2·8 to 7·9 per cent. of the admissions, and the average period of detention from 73·2 to 107·4 days.

Convalescent Hospital.—At the Northern Hospital 28, or ·69 per cent. of the cases transferred were, at the time of admission to this hospital incubating, while 218 subsequently contracted another infectious disease, equal to 5·4 per cent. on these admissions.

In the following table it will be seen that 484, or 3·7 per cent., of the cases discharged from the Board's hospitals, after a period of detention under 12 weeks, suffered from a superadded disease contracted in hospital, and that, after this period, there were 527 cases, or 21·7 per cent. of the cases discharged in the same period.

TABLE 52.

Period	No. of cases that suffered from superadded disease	Percentage on the number of discharges in each period ("All Cases")	No. of days detention in Hospital	Average period of detention
Under 8 weeks	109	1·77	4,992	45·79
8 to 12 „	375	5·41	26,553	70·94
12 to 14 „	200	16·36	18,090	86·55
14 weeks and over	327	27·11	41,113	125·72
Total	1011	6·52	90,748	89·76

It will be further noticed that, after a detention of 14 weeks and over, there were 327 cases, and that the total number of days during which the cases in this period were detained amounted to 41,113, an average of 125·7 days each, which is equivalent to detaining 734 patients for a period of 8 weeks.

The total number of scarlet fever patients admitted to the South-Eastern Hospital in 1902 was only slightly below this estimate.

The following table gives, for each hospital, the percentage of cases discharged after a period of over 14 weeks that contracted a superadded disease in hospital, together with the average period of detention of these cases.

Examination shows, that from 9·8 to 46·2 per cent. contracted another disease, the period of detention varying from 106 to 137 days.

TABLE 53.

Hospitals.	E H	S E H	N E H	W H	S W H	N W H	P H	B H	G H	F H	G F H	N H	Total
No. of Discharges	6	51	152	105	127	61	67	108	4	84	21	420	1206
Percentage that suffered from superadded disease	...	9·80	16·44	30·47	32·28	22·95	46·26	12·96	...	19·04	28·57	32·61	27·1
Average period of detention of the above ...	...	111·2	114·76	119·18	137·58	117·92	118·60	132·28	...	112·31	106·16	130·08	125·7

A point in connection with this subject, to which I must draw attention is that, when contrasting the periods of detention at the several hospitals, the percentage of those cases discharged which suffered from superadded diseases, should be taken into account. For, as only a few patients who contract the diseases are transferred to the Convalescent Hospital, it will be understood that the average period of detention of the discharges from the Acute Hospitals will be affected by the number of patients transferred. For example, at the North-Western Hospital, out of 2,268 cases of scarlet fever, all but 921 were transferred (see Chart VI), of which 108, or 11·7 per cent. had superadded infections, the average period of detention being 74·6 days, as compared with an average of 63·7 for the remaining 813 cases.

XIII.

Disinfection.

The following table is an analysis of the data relating to the disinfection at the time of the primary outbreak, and includes both Scarlet Fever and Diphtheria.

TABLE 54.

No. of Houses.	Disinfection of Rooms.		Disinfection of Bedding.			Disinfection of Wearing Apparel.		
	Usually occupied by patient.	Into which patient was moved after illness began.	The whole.	A portion only.	Not disinfected.	The whole.	A portion only.	Washed at home or not disinfected.
781	670	111	609	137	35	413	60	308
	85·78	14·21	77·97	17·54	4·48	52·88	7·68	39·43

Disinfection of the Room.—Whilst in most cases a gaseous disinfectant was used for this purpose, on some occasions the room was sprayed with an antiseptic solution, and, sometimes, a combination of both these methods was employed. Although frequently the woodwork was washed down either by the Sanitary Authority or the occupants of the house, the walls, except in those cases where this condition was expressly laid down by the Sanitary Authority, were not, as a rule, repapered or distempered. The bedroom usually occupied by the patient was, more often than not, the only room disinfected.

In 14 per cent. of the cases, as shown in the table, after an interval varying from one or two hours to several days, from the time the illness commenced, the patient was moved from the room he originally occupied to another, which, for various reasons, was considered either more convenient for nursing, or more suitable for disinfection. In most cases this was the parents' room. Occasionally, however, a bed was made up on the sofa or on chairs, in the sitting room or kitchen. As the infection of the patient was generally considered to commence at the time the rash was first observed, or when the doctor was called in and confirmed the parents' suspicions, for the purpose of disinfection the room last occupied by the patient was considered to be the infected one.

Disinfection of Bedding.—The bedding on the patient's bed in nearly every case, was removed for disinfection, but in a large number of cases where the bed was equipped with two mattresses, the top one only was removed, the under one frequently being a cumbersome straw palliasse. Occasionally, when there were other beds in the same room, in addition to the one occupied by the patient they were taken away. In 17·5 per cent. of the cases, the whole of the patient's bedding was not removed for disinfection, articles such as sheets and blankets being left behind to be washed at home. In 4·4 per cent., chiefly confined to one district, no bedding was removed for disinfection.

Disinfection of Clothing.—In some Boroughs the regulations respecting the disinfection of the wearing apparel were rigidly enforced, and every garment worn at the time, or immediately before the patient's illness commenced, was removed for disinfection. In other Boroughs a good deal of latitude was shown. In some instances, only the garment worn in bed was disinfected; in other cases all the clothing, except the patient's coat. Sometimes the clothes were either fumigated or sprayed, and in most cases, but not all, were subsequently washed at home, or "put out into the yard to air." In a few instances, the coat and hat were "sent to the cleaners"; whilst, in several instances they were "got rid of," or "were too old to disinfect." In one case "the coat was exchanged for hearthstone."

In 39·4 per cent. none of the patient's wearing apparel was removed for disinfection. In the majority of these cases the clothes were of washing materials, and it was explained that they had been put into water before the arrival of the Sanitary Officials. A frequent explanation given was to the effect that the patient had been in bed some days before the illness began, and it was therefore unnecessary to disinfect anything. These and other explanations apparently were not always accepted, for, while the clothes in some districts frequently were washed at home, in others it was only in exceptional circumstances that such a course was allowed.

Dual disinfection.—The practice which obtains of leaving infected bedding and wearing apparel to be washed on the premises is not, in my opinion, free from objection. If there were proper facilities for the purpose, and the instructions were rigidly adhered to, the boiling of the infected articles would ensure complete disinfection. But, while with regard to linen goods the process may be efficiently carried out, it is doubtful if such is the case where blankets and other shrinkable articles are concerned. Moreover, even when the intentions are of the best, difficulties are likely to arise, which make it necessary to keep the infected articles about the house for a longer period than is desirable, and mistakes are liable to occur which render ineffectual that portion of the disinfection carried out by the Sanitary Authority.

Several instances of this kind came under my notice. For example, in one case the infected sheets and curtains were used, while the whitewashers and painters were at work, to cover articles recently disinfected by the Sanitary Authority: in another, five days after the patient was admitted to hospital the infected clothing was still unwashed, as the mother was visiting her child, who was dangerously ill, and consequently could not spare the time. In a third case, the mother herself being the patient, it was arranged that a neighbour should wash the infected sheets, and other linen, but household difficulties arose, and the infected linen was still in the bedroom, shared by several children, on the day of my visit to the house. In another case the wash-house was used by several families, and the infected household had to wait several days for their turn. In one large tenement, where I made enquiries, a wash-house was set apart once a week for the families from infected houses.

In these tenements the regulations are enforced, and the facilities are better, but in houses not adapted for the use of several families, the washing arrangements are most primitive. The wash-house, which, in most cases, is situated in the back-yard, is generally too small, and may be used by more than one family at the same time. The room is usually full of steam, and the floor swilled with the washing from the infected clothing. In a case of this kind, I found the mother of the patient, in the only room she rented, washing the infected garments in a small pail. She excused herself by saying that the wash-house was damp and inconvenient.

Evading the Sanitary Authority.—In a few cases, I ascertained, that before the arrival of the sanitary officials, the patients' bedding which was new, was replaced with old bedding, and, in several instances, " everything of value was moved out of the room " when the parents discovered "what was wrong," or as soon as a doctor diagnosed the case. This was done more frequently by people who had had previous experience in the inconveniences attending disinfection. It was, therefore, more common when the " return case " was taken ill, than at the primary outbreak. The usual explanation was that disinfection spoiled the clothes, and it appeared to me that the damage done in some cases was unnecessary. Clothes and mattresses were scorched, stains were permanently fixed on sheets and pillow cases, dresses were crumpled up and stained with iron marks or by coloured garments, and at times returned quite unfit for wear. Consequently, when fresh cases arose, this added not a little to the trouble, as it was only with much difficulty the articles could be replaced.

In the following table is given the number of cases discharged to each Borough, and the number of these cases that, subsequent to discharge, were associated with the illness of "return cases."

The discharges are not corrected for errors in diagnosis, but are cases certified to be suffering from scarlet fever. In a few instances, two or more Boroughs are bracketed, since the information respecting the number of discharges to each Borough could not be obtained separately. These Boroughs are starred in the table.

TABLE 55.

(Period—from August, 1901, to July, 1902.)

Borough.	No. of Patients Discharged to each Borough.	No. of Infecting Cases.	Percentage
A*	1533	101	6·58
B	1255	73	5·81
C	374	21	5·61
D	1085	56	5·16
E*	1236	62	5·01
F	150	7	4·66
G	223	10	4·48
H	390	17	4·35
I	450	18	4·
J*	799	31	3·87
K	470	18	3·82
L	1246	47	3·77
M	397	15	3·77
N	978	36	3·67
O	769	26	3·38
P	437	14	3·20
Q	287	9	3·13
R	139	4	2·87
S	606	17	2·80
T	376	10	2·65
U	935	24	2·56
V	993	23	2·31
W*	673	13	1·93
X	72	1	1·38
Total	15,873	653	4·11

On examining the table it will be seen that in the several Boroughs the number of "infecting cases" varies very considerably, viz.:—from 1·3 to 6·5 per cent. Taken as a whole, the districts south of the river have the largest number, although the Borough "U" is an exception, while the central and eastern districts have the least.

Are the hospitals responsible for these unequal results, or is it due to some local condition in the Borough to which the patients are discharged? In other words, are some Boroughs more fortunate than others in being able to send their cases to hospitals where greater care is exercised in the discharge of patients? If this be so, then a hospital which has unfavourable results in one district, should have equally unfavourable results in another. On the other hand if it is to be attributed to the Borough itself, then the discharges to this sanitary district should give similar results, irrespective of the hospital from which the patients were sent.

To enquire into the first part of this question, I have prepared the following tables, which give for each hospital, (*a*) the number of cases discharged, (*b*) the boroughs to which they were sent, and (*c*) the percentage of those cases, which subsequent to their discharge, were associated with "return cases."

TABLE 56.

Percentage of infecting cases on the total number of discharges.	S. E. H. 4·59	
Boroughs.	Discharges.	Per centage of infecting cases.
B	103	7·76
L	74	6·75
V	144	2·08
S	50	2·

Percentage of infecting cases on the total number of discharges.	B. H. 5·37	
Boroughs.	Discharges.	Per centage of infecting cases.
A*	964	6·32
B	73	5·47
K	304	3·94
O	179	3·91

Percentage of infecting cases on the total number of discharges.	N. H. 3·62	
Boroughs.	Discharges.	Percentage of infecting cases.
G	67	7·46
I	134	5·22
P	122	4·91
M	181	4·96
K	61	4·91
E*	176	4·54
C	155	4·52
H	136	4·41
D	549	4·37
T	189	4·23
U	111	3·60
J*	362	3·59
Q	127	3·14
S	220	2·72
B	74	2·70
R	76	2·63
W*	318	2·51
N	532	2·44
V	179	2·23
L	186	1·61
O	42	Nil

	S. W. H. 4·03	
B	70	8·57
E*	172	4·65
P	45	4·44
L	270	3·33
U	178	2·24

	N. W. H. 4·65	
C	67	10·44
D	118	9·32
Q	101	4·95
N	316	4·11
W*	175	2·28

	N. E. H. 3·02	
D	397	4·53
J*	363	3·30
V	117	2·56
M	200	2·50
S	187	2·13
T	129	Nil

	P. H. 5·05	
A*	450	7·33
B	738	5·82
L	256	5·07
O	384	4·16
V	400	2·75
S	87	2·3

	W. H. 3·39	
H	175	5·14
G	83	4·81
F	49	4·08
I	199	4·02
C	117	2·56
E*	49	2·04
P	133	1·80
Q	42	Nil
W*	36	Nil

	F. H. 3·63	
B	126	7·14
E*	795	4·90
L	319	4·07
P	121	3·30
I	96	2·08
U	556	1·97
F	53	1·88
G	56	Nil

	G. F. H. 2·33	
U	45	4·44
A*	64	3·12
B	69	2·89
L	74	2·70
V	64	1·56
O	68	1·47

South-Eastern Hospital.—At the South-Eastern Hospital, 4·5 per cent. of the total number of patients discharged are shown to have been subsequently associated with the illness of "return cases," that is, were alleged to be "infecting cases." To the Borough "B," which has one of the highest percentages of "infecting cases," the same hospital discharged 103 cases, of which 7·7 per cent. were alleged to be "infecting cases." To three other Boroughs, namely, "L," "V" and "S," they discharged, 74, 144 and 50 cases, respectively. In the Borough "L," the number of "infecting cases" was 6·7 per cent, whilst the two remaining boroughs had 2 per cent. only of such cases.

Park Hospital.—The results at the Park Hospital indicate that 5 per cent. of their total discharges were alleged to be "infecting cases," and that in the several boroughs to which their discharges were sent, the number of "infecting cases" varied from 2·3 per cent. in the Borough "S" to 7·3 per cent. in Borough "A."

Fountain Hospital.—At the Fountain Hospital, the "infecting cases" averaged 3·6 per cent. In the Borough "B" the discharges from this hospital are accredited with 7·1 per cent. of "infecting cases"; in the Borough "E," to which they discharged 795 cases, with 4·9 per cent. But in the Borough "U," to which they discharged no less than 556 cases, the number of "infecting cases" was only 1·9 per cent.

Northern Hospital.—The results in connection with the Northern Hospital are even more remarkable. This hospital discharged 4,160 patients to 21 separate Boroughs.

Commencing with "nil" in Borough "O," to which they discharged 42 patients, the number of "infecting cases" rose by gradual increments to 7·4 per cent. in Borough "G."

These examples which I have taken are not exceptional, for, if any of the other hospitals be examined, similar results will be obtained.

Dealing with the second portion of the question, if the boroughs be contrasted, it will be seen from the accompanying table (57) that, while the discharges to certain Boroughs show a uniformly high percentage of "infecting cases," in other Boroughs, "infecting cases" are uniformly low, irrespective of the hospitals from which the patients are discharged. For example, the Acute Hospitals which discharge patients to Boroughs "B" and "E" do badly, whereas, in the Boroughs "V" and "S," the results are uniformly good.

TABLE 57.

Table showing the number of discharges to each Borough, and the Hospitals from which they were sent, also the "infecting cases" arising from the same.

Percentage of Infecting Cases on the total number of discharges.	S.E.H. — 4·59		S.W.H. — 4·03		F.H. — 3·63		P.H. — 5·05		B.H. — 5·37		N.E.H. — 3·02		W.H. — 3·39		N.W.H. — 4·65		N.H. — 3·62		G.F.H. — 2·33		Totals.* —	
Boroughs.	Discharges.	Percentage of Infecting Cases.	Discharges.	Percentage of Infecting Cases.	Discharges.	Percentage of Infecting Cases.	Discharges.	Percentage of Infecting Cases.	Discharges.	Percentage of Infecting Cases.	Discharges.	Percentage of Infecting Cases.	Discharges.	Percentage of Infecting Cases.	Discharges.	Percentage of Infecting Cases.	Discharges.	Percentage of Infecting Cases.	Discharges.	Percentage of Infecting Cases.	Discharges.	Percentage of Infecting Cases.
A*							450	7·3	964	6·3									64	3·1	1533	6·5
B	103	7·76	70	8·5	126	7·1	738	5·8	73	5·4							74	2·7	69	2·8	1255	5·8
C													117	2·5	67	10·4	155	4·5			374	5·6
D											397	4·5			118	9·3	549	4·3			1085	5·1
E*			172	4·6	795	4·9											176	4·5			1236	5·
F					53	1·8							49	4·							150	4·6
G					56	Nil.							83	4·8			67	7·4			223	4·4
H													175	5·1			136	4·4			390	4·3
I					96	2·							199	4·			134	5·2			450	4·
J*											363	3·3					362	3·5			799	3·8
K									304	3·9							61	4·9			470	3·8
L	74	6·7	270	3·3	319	4·07	256	5·									186	1·6	74	2·7	1246	3·7
M											200	2·5					181	4·9			397	3·7
N											67	5·9	52	7·6	316	4·1	532	2·4			978	3·6
O							384	4·1	179	3·9							42	Nil.	68	1·4	769	3·3
P					121	3·3							113	1·8			122	4·9			437	3·2
Q															101	4·9	127	3·1			287	3·1
R															53	3·7	76	2·6			139	2·8
S	50	2·					87	2·3			187	2·1					220	2·7			606	2·8
T											129	Nil.					189	4·2			376	2·6
U			178	2·2	556	1·9											111	3·6			935	2·5
V	144	2·					400	2·7			117	2·5					179	2·2	64	1·5	993	2·3
W*															175	2·2	318	2·5			673	1·9
X																						

* See Table 55. To avoid obscuring the point this table is meant to demonstrate, where the patients discharged from a hospital to a Borough did not exceed 50, except in a few instances, the number discharged is omitted. Thus the number of patients discharged from the Grove and Eastern Hospitals and to the Borough X are not shown.

A uniformly high or low number of "infecting cases" is, however, not invariably the rule, For instance, in the Borough "L," the discharges from the South-Eastern Hospital are responsible for 6·7 pre cent. of "infecting cases," the Park Hospital for 5 per cent., the Fountain Hospital for 4·7 per cent., and the South-Western Hospital for 3·3 per cent.

The evidence adduced in these tables shows, that, although the hospitals may be partly responsible for the unequal results, the evidence also points to some local condition in the districts to which the patients are discharged. What this local condition may be is beyond the scope of my enquiry, but the subject is one which deserves attention.

Unequal care in disinfection might be suggested, but, so far as I am able to judge, the disinfection is done quite as efficiently in several boroughs which have a relatively larger number of "infecting cases," as in others accredited in this table with better results.

The fact, however, remains that the illness of "return cases" was intimately connected with the discharge of the patient from hospital, and, although not a few cases proved to be mere coincidences, I believe that very many more "return cases" were due to personal infection, than to defective disinfection.

The chief points in support of the theory of personal infection are: (1) that the complicated cases were more frequently associated with the illness of "return cases" than the uncomplicated, and that the majority of the "infecting cases" suffered from a morbid condition of the nose which condition is admitted to be the chief source of infection. (2) The seasonal incidence, and the higher mortality of the "return cases," together with the fact that a longer period of detention tends to reduce the number of these cases, are also facts in favour of personal infection. (3) The special age incidence of the "infecting case" also points to the patient rather than to his clothing as the source of infection, for, otherwise, the ages would be more equally distributed, or in any case, instead of occurring among children under 10 years of age, the special incidence should be associated with adults, as their clothes are not so easily washed, and being more costly, are more likely to escape disinfection. The problem requiring solution therefore is to determine the extent to which these "return cases" are due to faulty disinfection.

On this point my investigations have not been pursued sufficiently far to enable me to express anything like a positive opinion, but it is my impression that disinfection has not any appreciable effect either upon the number of "return cases," or on the "secondary cases," which occur at varying intervals after it has been carried out.

XIV.

Secondary Cases.—The occurrence of these cases appears to be quite irrespective of the disinfection. The explanation of this, I believe, lies in the fact that many of the "secondary cases" were infected before the removal of the "primary case," or if subsequent to removal, either from the same source as the "primary case," or, what I believe was more common, from an unrecognised case. This was so in a number of instances in which the "return case" formed only one of a series of consecutive cases occurring in the same house after the removal to hospital of the preceding case. To illustrate this, a number of instances is given in the appendix, and in the following list of cases, which I have divided into five groups. (1) Cases in which one or more members of the same family suffered after the removal of the "primary case," from an illness the nature of which was indefinite. (2) Cases of scarlatina sine eruptione. (3) Cases in which the rash was preceded by an illness lasting longer than the usual period of invasion. (4) Cases in which there was, apparently, a latent period between the reception of infection, and the onset of the illness. (5) "Carrier" cases.

My experience, of course, is limited to the houses in which "return cases" occurred, but it is probable that similar cases are associated with outbreaks of scarlet fever in other houses

Group 1. To take the first group of cases, the diagnosis of the illness varied with the age of the patient. In infants "gum rashes," "bronchitis," "teething and diarrhœa," were commonly diagnosed, whilst older children suffered from "mumps," "bronchitis with otorrhœa," and "heavy colds."

Among children, isolated cases of measles occurred simultaneously with other cases of scarlet fever, and, in the case of adults, "influenza and quinsy" were frequently diagnosed, but the influenza did not, as a rule, affect more than one member of the family.

(1) Case 605. In this case the interval was 39 days. The first patient was taken ill on April 24th, and was discharged from hospital on the 3rd July.

On June 2nd, or 39 days after the first case was taken ill, a child living in the same house was admitted to the hospital suffering from scarlet fever.

Eight days later another child was taken ill, and, after an interval of another 8 days, the wife of the first case was admitted to hospital.

On July 22nd, 34 days after the last patient, an adult, who three days previously came on a visit to this house, was taken ill with scarlet fever.

Two relatives, who visited the house, suffered from sore throats and were confined to bed, shortly after the " primary case " was admitted to hospital.

The source of infection of these " secondary cases," was, probably, an infant, aged four months. She had a swollen neck and was " very ill for some time."

The exact nature of her illness was not known.

(2) Case 1. In this case the " interval " between the primary and secondary case was 19 days.

A. J. was admitted to hospital on May 13th. Five days later, his sister, aged one year two months, was taken ill, and was said to be " teething " ; her illness lasted about a week.

Three days later, on May 21st, the mother of these children was taken ill with " influenza." She suffered from headache, sore throat, and " pains all over." On May 31st, that is ten days after the last patient, and nineteen days after the primary case, E. J., aged 6 years, was admitted to hospital, suffering from scarlet fever.

On June 4th, after a further " interval " of four days, the father of the secondary case had a sore throat, and was obliged to stay at home for two or three days.

(3) Case 550. In this instance, a series of cases occurred in the house, at intervals of 2, 8, 3, and 15 days. The cause of the outbreak is not known, but the only susceptible child who escaped suffered from a discharge from her nose. She had no other symptoms.

(4) Case 10. C. D., aged 2 years, was discharged from hospital on November 14th. On the following evening L. D., aged 3, had a sore throat, and, later, a swollen neck and rhinitis.

Three days afterwards, A. D., aged 8 years, was taken ill with scarlet fever. A short time later (exact date not known), W. D., aged 13, had an attack of " mumps." Desquamation was present on the thighs and abdomen at the time of my visit. The patient was attending school.

(5) Case 9. P. C., aged 6 years, was discharged from hospital on November 14th. Six days later, " return case," aged 4, was taken ill with scarlet fever, and about the same time a child, aged one year and six months, suffered from bronchitis and otorrhœa.

GROUP 2. **Scarlatina Sine Eruptione**—In 14 per cent. of the houses in which " return cases " occurred, one or more members of the family suffered from sore throats. In 23 cases the throat illness took place while the " infecting case " was still in hospital, and in 81 cases after the return. Of the latter cases about an equal number occurred before and after the illness of the " return cases."

Not infrequently, these cases were taken ill and suffered from almost the same symptoms as did the " return case," and, although scarlet fever was suspected, no rash or desquamation was observed. Persons of all ages were affected, but the throat illness was most common among adults.

The usual symptoms other than sore throat, were a rise of temperature, headache, shivering, loss of appetite, nausea, and, occasionally, vomiting. The tongue was at first thickly furred, but became cleaner after three or four days. The papillæ were prominent; but peeling was not observed. The glands were tender, and, at times, swollen.

Sometimes the patients complained of " pains all over," and one or two had slight delirium. The illness, which usually lasted a week, was by no means always mild, for convalescence in some cases was not completed for two or three weeks.

The following cases are some of the most common examples.

(1) Case 28. L. M., aged 5 years, was discharged from hospital July 27th. Two days later, midnight 28th—to 29th July, Mr. M. was taken ill with headache, sore throat, vomiting, and pyrexia. On the following day the rash appeared.

At about 5 a.m., July 29th, the wife of the last patient was taken ill. She had the same symptoms as her husband, but no rash followed. When seen five days later the throat was very much injected and swollen.

The tongue was cleaner than it had been, but had not peeled: the papillæ at the tip and sides were prominent: the glands of the neck were tender: there was no desquamation, and the patient felt very weak after getting up.

(2) Case 289. C. C., aged 10 years, was discharged from hospital on the 21st December. Five days later, December 26th, L. C., aged one year and ten months, was taken ill with scarlet fever. Three days later, December 29th, Mrs. C., aged 32, was down with the same complaint.

On the day his wife was taken ill, Mr. C. had a very sore throat with which he was confined to his bed for a week. The doctor visited him twice daily as he suspected scarlet fever, but no rash or desquamation was observed. Mrs. C.'s sister, who visited the patient, contracted a sore throat and was also in bed a week.

(3) Case 547. V. F., aged 3 years, was discharged from hospital on March 12th. Ten days later on March 22nd, F. F., aged 13, and D. F., aged 8 years, were taken ill. They both suffered from the same symptoms, but D. F. had no rash. F. F. was certified to be suffering from scarlet fever, and her sister D. F. from diphtheria. The diagnosis in hospital of the latter case was tonsillitis. N.B.—D. F. had had scarlet fever two years previously.

(4) Case 3. The "interval" in this case was 8 days. On August 25th, W.B., aged 3 years, suffered from scarlet fever. Two days later his mother was feverish and had severe sore throat, headache, sickness, furred tongue. She was in bed ten days.

Six days later her husband was taken ill and was admitted to hospital, suffering from scarlet fever.

(5) Case 7. The "primary case" was taken ill with scarlet fever on August 18th, the second case on September 4th, and the third on September 16th. The interval between the first and second case was 17 days, and between the second and third 12 days.

The mother of these cases had a severe sore throat and "pains all over," and was confined to bed, when the illness of the "primary case" commenced.

The house was thoroughly disinfected after each case was admitted to hospital.

In a large number of cases, in which the "interval" was unusually long, illness of the throat intervened.

(1) Case 92. In this case the "interval" was 25 days.

"Infecting case" S. B., aged 17 years, was discharged from hospital on September 4th, after a detention of 41 days. Eight days later, his father, aged 45, was taken ill with severe sore throat, delirium at night, and high temperature. He was in bed eight days. About the same time, or shortly afterwards, his daughter, E. B., aged 13 years, had a "slight sore throat." She had had scarlet fever four years previously.

On September 29th, that is 25 days after S. B. returned home, the "return case" G. B., aged 3 years, was taken ill with scarlet fever. The "infecting case" S. B. suffered from a sore throat, from the 8th to the 13th of September.

(2) Case 102. The "interval" in this case was 26 days. "Infecting case" R. B., aged 4 years, was discharged from hospital on September 2nd, after a detention of 50 days. On September 10th, eight days later, his mother had a "severely ulcerated throat" and was obliged to remain in bed one week. She was not subject to sore throats.

Ten days later, that is 26 days after R. B. returned home, his sister, W. B., aged 8 years, was taken ill with scarlet fever.

(3) Case 453. In this case the "interval" was 13 days. "Infecting case" E. H., aged 4, was discharged from hospital, on February 27th, after a detention of 62 days.

Three days later, E. R., aged one year and nine months, living in the same house, was taken ill. She had a "rash under the skin," and a "touch of measles, complicated with pneumonia," was diagnosed. The patient died on the seventh day of illness.

Ten days later, her sister, W. R., aged 3, was taken ill with scarlet fever.

Two days later, another child contracted scarlet fever, and died.

The discharge from hospital of these tonsillitis cases, which are frequently certified on admission to be suffering from diphtheria, is occasionally followed by "return cases" of scarlet fever.

(1) Case 1. A. B., one year old, was admitted to hospital December 25th, certified diphtheria. On December 27th, her sister, D. B., aged 3 years, was also certified to be suffering from the same complaint. There was no evidence of diphtheria in either of these cases after admission to hospital.

They were both diagnosed "tonsillitis," and were discharged after 33 and 31 days' isolation.

Eight days later, February 4th, their brother, F. B., aged 5 years, was taken ill with scarlet fever. The diagnosis was confirmed in hospital.

(2) Case 2. L. W., aged 5 years, was certified to be suffering from diphtheria, and was admitted to hospital on August 14th.

On August 23rd he was discharged; the diagnosis in hospital was "tonsillitis."

Seven days later, August 30th, E. W., aged 7 years, contracted scarlet fever; the diagnosis in hospital was confirmed.

(3) Case 3. C. D., aged one year and ten months, was admitted to hospital certified to be suffering from diphtheria. "Tonsillitis" was diagnosed in hospital, and on November 14th the patient was discharged. Five days later, "return case" A.D., aged 4 years, was admitted to hospital suffering from scarlet fever.

I have no doubt that in some of the cases of scarlatina sine eruptione, a rash was really present, but, being transient, escaped notice, for, occasionally, we find cases with a history of a rash on the first or second day of the illness, but no signs or symptoms of the disease, except a slight faucitis, either at the time of admission, or during their stay in hospital. These transient erythemata also occur in hospital, and, apparently, run the same course, while, like the tonsillitis cases, they are, after discharge, sometimes followed by "return cases."

In each of the following cases, the rash had faded before the patients were admitted to hospital.

(1) Case 4. A.D. and M.L., both aged 14 years, were admitted to hospital, on August 23rd, certified to be suffering from scarlet fever. They were kept under observation for 39 days, when they were discharged. They showed no signs of scarlet fever while in hospital, but after discharge A.D. had a mild attack of nephritis.

Other cases of scarlet fever occurred in the school from which she was admitted.

(2) Case 5. W. E., aged 8 years, was admitted to hospital, certified scarlet fever. He had slight rhinitis while in hospital, but there was no evidence of scarlet fever.

He was detained in hospital 22 days, and three days after discharge, infected his sister, A. E., aged 2 years, with scarlet fever.

(3) Case 6. F. H., aged 7 years, was admitted to hospital, certified scarlet fever. While in hospital he suffered from enlarged glands, but there were no symptoms of scarlet fever during the 23 days he was under observation. Two days after discharge he suffered from otorrhœa, and two days later his brother and sister were taken ill, and were admitted to hospital with scarlet fever. They both had sharp attacks.

In the next two cases, the patients suffered from a faint erythema in hospital. They were examined carefully each day, but no desquamation was observed.

(4) Case 7. A. B., aged 6 years, contracted scarlet fever in hospital on July 10th. He had a punctate rash, sore throat and enlarged glands. The tongue did not peel, and no desquamation was seen.

He was discharged on August 14th, and eleven days later E. B., aged 3 years, contracted scarlet fever.

(5) Case 8. A. M., aged 3 years, contracted scarlet fever in hospital on July 1st. She had a punctate rash on the chest and limbs, and some pyrexia. The tongue was papillated. Careful notes were made each day, but no desquamation was observed. On August 1st, she was discharged. Five days later, her brother, C. M., aged 12 years, developed scarlet fever.

Group 3. In the following cases the onset of the rash was preceded by an illness lasting one or two weeks, or longer, the nature of which, and the circumstances of the case, suggested that the patient was infected some time before the appearance of the rash. The illness was not always continuous, for occasionally there was an interval of a few days, when the sore throat and other symptoms of scarlet fever reappeared.

(1) Case 460. A. S., aged 6 years, two days before alleged "infecting case" was discharged, had headache and was drowsy, and the following day his neck was swollen and tender.

There was malaise and loss of appetite, which symptoms continued for 8 days, when the rash appeared.

(2) Case 203. The "infecting case," was discharged on November 6th.

On November 10th, four days later, M.B., aged 16 years, had headache, sore throat, loss of appetite and felt ill.

The symptoms continued until November 19th, when the rash appeared.

(3) Case 65. On August 16th, Mrs. F. had a severe sore throat, which "left her very weak." She was ill about three weeks.

About the same time, August 19th, F. F., aged 5 years, who was subsequently the "return case," had sore throat and was in bed a few days.

On August 29th his sore throat returned and other symptoms of scarlet fever set in.

On the morning of the following day, August 30th, the rash appeared.

The same afternoon, the alleged "infecting case" was discharged from hospital

F. F. was a cripple and unable to leave the house.

(4) Case 370. J. L., aged 5 years, was discharged from hospital on January 23rd.

"Return Case," B. L , aged 4 years, was taken ill 2 days later.

On the 25th, 26th and 27th, he attended the doctor's surgery.

He apparently recovered until February 8th, when the rash was discovered.

(5) Case 534. S. W., aged 4 years, was discharged from hospital, March 19th.

Two days previous to this D. W. aged 7 years, had an "ulcerated sore throat," which lasted 3 weeks.

He apparently recovered, but about four weeks later he had a similar sore throat. On this occasion the rash was present.

When admitted to hospital on May 9th, 51 days after the discharge of alleged "infecting case," he was dangerously ill.

Group 4. In the following cases the circumstances suggest that the patient was infected for some days before his illness commenced, apparently acting for a time as a carrier of infection. The possibility of fresh infection from some external source, can only on rare occasions be eliminated, but I believe that in the case quoted below, this, together with the question of faulty disinfection, may be excluded.

(1) Case 368. In this case the "interval" was 13 days. E. O., aged 9, was discharged from hospital on January 13th, and left home again for the country on January 16th. On January 26th her brother J. O., aged 8, was taken ill with scarlet fever. E. O. was then from home.

(2) Case 508. M. B., aged 5 years, was discharged from hospital on March 28th. Six days later his sister, E.B., aged 3, suffered from scarlet fever. On the following day, April 4th, she was taken to hospital, and on the same day the "infecting case" went from home for several weeks. On April 16th, after a further interval of 13 days, M. B., aged 19, was taken ill with scarlet fever. There were no other children in the house.

(3) Case 335. The "interval" in this case was 19 days. V. C., aged 5 years, was admitted to hospital on the 15th November, suffering form scarlet fever. For the first two days after her illness commenced, she was nursed by her mother, who was confined to bed with a fractured leg. On December 4th Mrs. C., the mother, who was still in bed, developed diphtheria. All the other members of the family who were grown up, remained perfectly well until after the discharge of V. C. the primary case, when after an "interval" of seven days, one sister contracted diphtheria and scarlet fever and another diphtheria only. The primary case had no clinical evidence of diphtheria, either in hospital or after discharge, but an almost pure culture of diphtheria bacilli was obtained from her throat three weeks after she left hospital.

(4) Case 481. (1) E. T., aged 4 years, was taken ill with scarlet fever on December 29th. (2) H. T., aged 2 years, on January 16th. (3) P. T., aged nine months, on February 10th, and (4) F. T., aged 6 years, on April 3rd, so that the "interval" between these cases was 18, 25, and 52 days, respectively. The last case was taken ill 5 days after P. T., the third case, returned home from hospital. The house was well disinfected and there were no other cases of illness. One child aged 9, alone escaped.

(5) Case 417. L. H., aged 5 years, was taken ill with scarlet fever on November 22nd; (2) J. H., aged 6, on December 3rd; (3) R. H., aged 8, on December 14th; (4) A. H., aged 2, on December 24th, and (5) A. L., aged 4, on the 28th February. The "interval" between these cases was therefore 11, 11, 10, and 66 days respectively. The illness of the last case commenced two days after the fourth was discharged.

The following cases also suffered from scarlet fever.

(6) Case 542. (1) D. K., aged 3 years, onset of illness March 4th : (2) M. K. and (3) B. K., aged 19 and 12 years, respectively, onset of illness 15th April : (4) F. K., aged 17, and (5) B. K., aged 7, onset of illness April 24th : (6) A. K., aged 15 years, onset of illness 7th May.

The "interval" here was 42, 9, and 13 days, respectively. The last case occurred nine days after case (1) was discharged. There were no other children in this house.

All the patients were, immediately after the illness began, admitted to hospital, and after each case the house was disinfected.

Group 5. "**Carrier**" **Cases.**—In over 70 cases which I investigated, "return cases" of diphtheria occurred subsequent to the discharge of scarlet fever patients.

None of the alleged "infecting cases" had any clinical signs of diphtheria, either in hospital or after discharge, but the bacilli were found in several cases either in the nose or throat. In the previous group of cases I endeavoured to show that there may be a latent period, longer than the usual incubation occurring between the reception of infection, and the onset of illness, but, whether individuals can mechanically carry the infection of scarlet fever and yet remain well, as is known in the case of diphtheria, is uncertain, in the absence of bacteriological evidence to this effect.

Obscure outbreaks of scarlet fever were frequently met with, which suggested to me that such was probably the case. In the following list are some examples which came under my notice, from which it will be seen that at the primary outbreak only one child was attacked, who was in nearly every instance, the youngest member of the family.

No. of Case.	No. of children in the family.	Ages of			
		Children attacked at primary outbreak.	Alleged "return cases."	Children not attacked.	Children who had had a previous attack.
254	2	$1\frac{10}{12}$	3	—	—
263	6	$\frac{11}{12}$	3, 6	11, 8, 4	—
81	5	$1\frac{7}{12}$	5	3, 6, $\frac{4}{12}$	—
131	3	$\frac{5}{12}$	$1\frac{1}{12}$, 10	—	—
288	5	$1\frac{6}{12}$	4	15, 9	12
306	2	$1\frac{8}{12}$	$1\frac{8}{12}$	—	—
360	2	$1\frac{10}{12}$	6	—	—
308	5	$1\frac{11}{12}$	9	6, 5, 3	—
468	3	$1\frac{7}{12}$	10	7	—
527	2	$1\frac{7}{12}$	—	—	2
557	5	$\frac{7}{12}$	$2\frac{6}{12}$	6	8, 4
564	3	$1\frac{3}{12}$	5	4	—
575	2	$1\frac{1}{12}$	$1\frac{1}{12}$	—	—
583	1	$1\frac{2}{12}$	—	—	—
53	2	$1\frac{9}{12}$	3	—	—
197	5	2	12	10, 3, $\frac{2}{12}$	—
235	4	2	6	4, 7	—
255	2	2	4	—	—
301	2	2	7	—	—
309	2	2	6	—	—
330	3	2	9	12	—
392	3	2	4	8	—
402	3	2	5	—	9
406	2	2	4	—	—
463	4	2	$1\frac{2}{12}$	8, 7	—
477	3	2	3	$\frac{4}{12}$	—
479	4	2	8	10, 1	—
518	6	2	8	10, 5, $\frac{7}{12}$	4
529	4	2	4	10, 5	—
608	3	2	$6\frac{7}{12}$	—	—

On enquiry, it was common to be told that the child had not been out of the house for several days before the fever commenced, and then only with the mother. There was no history of a previous illness in these houses, and the parents were quite at a loss to explain the source of the infection, since, as far as they were aware, they had not visited any houses where there had been any recent sickness. In my opinion the fact that the baby, who usually gets more than its share of caresses, was the only one attacked, lends considerable weight to the view that the infection was not conveyed by the usual means, but either by the parents, the children attending school, or by visitors acting as carriers of infection.

Scarlet fever, subsequent to the return of diphtheria cases.—In thirty cases, to which reference has already been made, cases of scarlet fever followed the return from hospital of diphtheria patients. In ten of these cases the evidence showed that the discharged patient was the cause of the fresh outbreak, and in eight cases, although there was a possibility that they also were the cause of the "return case," I hesitated to put them into the same group as the previous cases, since the evidence was not so conclusive.

The following table gives the proportion located to each group :—

Table 58.

Classification.	A.	B.	C.
No. of cases ...	10	12	8

Over 50 per cent. of these cases suffered from a mucous discharge, resembling in this respect the "infecting cases," which were associated with outbreaks of scarlet fever rather than diphtheria. Four of the "A" cases in the above table had symptoms while in hospital, which suggest that they may have been infected with scarlet fever, but the remaining cases had a normal attack of diphtheria.

The clinical notes of these four cases are as follows :—

Case 1. Pyrexia, transient erythema, 31 days before discharge : no desquamation. "Return case," "interval" 5 days.

Case 2. Pyrexia, vomiting, faucitis, November 15th, two months before discharge. No rash. "Return case," "interval" 10 days.

Case 3. Transient erythema in hospital. Desquamation and rhinitis after discharge. This patient was isolated at home 25 days. Three days after quarantine expired "return case" was taken ill. (For further particulars see Case 14, p. 51.)

Case 4. No evidence of scarlet fever in hospital. Desquamation after discharge. "Return case," "interval" 6 days

Of the remaining six cases, four had a mucous discharge after leaving hospital, one had a morbid condition of the throat, and the last case was apparently quite normal.

The following are the clinical notes of four of the cases:—

(1) Case 6. P. H., aged 7 years, was in hospital 36 days, and was discharged on October 15th. He had no complication in hospital.

Two days after he returned, the only other child in this house, A. P., aged one year and nine months, was taken ill with scarlet fever.

(2) Case 11. A. D., aged 6 years, was in hospital 41 days. On December 9th, four days after discharge, his sister, A. D., aged one year and ten months, developed scarlet fever The "return case" had not been out of the house for several days. There had been no visitors to this house and the child was constantly under her mother's care.

The only other child in this house had had scarlet fever the previous year.

In the next two cases the "return case" contracted both diphtheria and scarlet fever, and the circumstances left very little doubt but that the discharged patient conveyed the infection.

(3) Case 1. S. G., aged 7 years, was discharged from hospital, on April 3rd. Complications in hospital comprised otorrhœa, tonsillitis and jaundice. Condition after discharge, slight otorrhœa and rhinorrhœa. Seven days after this patient was discharged, "return case" was taken ill with scarlet fever and diphtheria.

(4) Case 2. E.B., aged 6 years, was discharged from hospital on April 25th after 44 days detention. Four days later, W.B., aged 2, contracted scarlet fever and diphtheria.

There were no other children in this house, which was clean and had been thoroughly disinfected.

The "infecting case" had no complications either in hospital or after discharge, but while she was in hospital several cases of scarlet fever occurred in the ward in which she was treated.

Although in several instances diphtheria patients were within a few days after discharge re-admitted to hospital, suffering from scarlet fever, it is interesting to note that none of the above 30 cases contracted scarlet fever after their return home, in spite of the fact that they were probably in contact with the "return case" for a short time after the latter developed scarlet fever.

If the views expressed in connection with these groups be correct, the conclusions suggested are :—

(1) That persons suffering from sore throat, or other anomalous illnesses, may convey scarlet fever infection to others.

(2) That there may be a latent period after the reception of the infection, and the onset of the illness.

(3) That, after the reception of the infection, and before the appearance of the rash, patients may suffer from an illness lasting considerably longer than the usual period of invasion.

(4) That, without having previously suffered from this disease individuals may act as carriers of scarlet fever infection, and continue to be in normal health.

XV.

Clinical varieties.

In the previous sections the statistical data relating to this subject have been dealt with. I now propose to illustrate by means of the following cases some of the clinical features of the "infecting cases." Clinically they may be classified under two heads (A) the uncomplicated cases, and (B) the complicated cases.

Group A.—The cases in this group are well in the minority. As a rule they have had a mild attack of scarlet fever, and their period of detention has not been a long one. After leaving hospital their condition is in most cases either quite normal, or they may present enlarged tonsils or a chronic morbid condition of the throat. Their infection usually passes off rapidly, and in most cases only one "return case" is infected—commonly the child who occupied the same bed, or came intimately in contact with the "infecting case."

These cases appear to be analagous to the "return cases" which occasionally follow after the discharge from home quarantine, and the explanation may be that the normal process of elimination had not been completed before the patient was discharged.

The following cases are some of the commonest met with in this group.

(1) Case C. K. C., aged 7 years, was discharged from hospital 20th October. He was isolated at home 5 days after discharge. On October 30th five days later, "return case," aged 5 years, was taken ill. "Infecting case" was in hospital 43 days.

(2) Case F. G. F., aged 1 year, was discharged from hospital 29th November. "Return case," aged 3 years, was taken ill three days later. The "infecting case" contracted scarlet fever in hospital 28 days before she was discharged.

(3) Case 335. V. C., aged 5 years, was discharged from hospital 1st January, after 47 days' detention. She had no morbid condition, but D. B. were found in her throat after discharge. After "intervals" of 7 and 10 days, she infected two "return cases," ages 9 and 7 years.

(4) Case 622. H. A., aged 6 years, was discharged from hospital 17th July, after 54 days' detention. After an "interval" of 14 days he infected "return case" J. A., aged 3 years.

In the above cases no complications were recorded in hospital, and the condition was normal after discharge.

In other cases belonging to the same group, although there were no complications in hospital, after leaving hospital, the "infecting case" suffered from a cold or watery nasal catarrh, but as in the previous cases, the infection passed off more or less rapidly.

It is not improbable that the nasal discharge, by causing a dislodgement of stray micro-organisms, formed a ready vehicle for the transmission of infection to others.

These cases are as follows:—

(1) Case 410. A. H., aged 8 years, was discharged from hospital on 3rd February. Nine days later he infected L. H., aged 5 years. On the day "return case" was taken ill, "infecting case" had a cold in his head and a cough.

(2) Case 530. M. B., aged 4 years, was discharged from hospital April 12th. After an "interval" of 13 days, "return case" was taken ill. He had a nasal catarrh the day after he returned, and subsequently his nose got sore and the watery discharge became blood-stained.

(3) Case 118. R. K., aged 6 years, was discharged on October 9th. Eight days later "return case" M. K., aged 2 years, was taken ill. Two days after he left hospital, "infecting case" had a "cold in his head."

Group B.—The cases in this group differ from those in the previous group, in that the infection may continue long after the patient has left hospital—in some cases even for several weeks. The intensity of the infection appears to bear some relation to the nature and duration of the complications. For example, should a running from the nose appear for the first time immediately after the patient leaves the hospital, and more particularly should the discharge be purulent, nearly all the persons unprotected by a previous attack who come in contact with the "infecting case" contract scarlet fever. The type of illness is usually sharp, and the "return case" seldom escapes without severe "secondary" or septic complications. Adults and the less susceptible members of the family who are infected suffer from sore throats, but the severity of the illness, and the prostration which not infrequently follows, suggest that the illness is not an ordinary abortive attack of scarlet fever, but probably a mixed infection.

In other cases belonging to this group, where the discharge has become chronic, and, more particularly if it is non-purulent, the "return case" may not be infected until after a long "interval," although, during this time, he may have been in intimate contact with the "infecting case," which suggests that the virus had become attenuated. To illustrate the "infecting cases" in this group they have been sub-divided as follows:—

(A) The "infecting cases" in this sub-division were apparently normal after discharge, but there was either a history of rhinorrhœa or some secondary complication in hospital during the late stage of the patient's illness.

(1) Case 188. G. S., aged 6 years, discharged 15th November. In hospital 60 days. Rhinorrhœa ceased 39 days before discharge. After return home, nose normal, glands enlarged. "Return case," W. S., aged 8 years, was taken ill after an "interval" of 5 days.

(2) Case 366. W. L., aged 4 years. Discharged 15th January. In hospital 60 days. Rhinorrhœa ceased 9 days before discharge. There was no apparent morbid condition after leaving hospital. "Return case," A. L., aged 2 years, was taken ill after an "interval" of ten days.

(3) Case A. C. K., aged 5 years, was discharged from hospital December 10th. In hospital 72 days. There was no morbid condition after discharge, but he suffered from rhinorrhœa to within three days of his discharge from hospital. "Return case," A. K., aged 3 years, was taken ill after an "interval" of 6 days.

(B) Here the morbid condition present after discharge represented a late stage of the affection. For instance, in the rhinitis cases there was usually a history of rhinorrhœa, and although the latter had ceased some time before the patient was discharged, the mucous membrane remained morbid.

(1) Case 316. R. H., aged 6 years, was discharged January 13th. In hospital 76 days. "Return case," L. H., aged 4, was taken ill after an interval of 6 days. "Infecting case" suffered from rhinorrhœa until a month before discharge. Since he has been home he has had a sore nose.

(2) Case 254. H. C., aged one year and ten months, was discharged from hospital 12th December, after 90 days' detention. "Return case," M. C., aged 3, was taken ill after an "interval" of three days. H. C. suffered from rhinorrhœa up to thirteen days before discharge. After returning home he had a slight nasal catarrh for one or two days.

(3) Case 483. C. G., aged 2 years, was discharged from hospital 27th March, after 44 days' detention. J. G., aged 5, was infected after an "interval" of 10 days. "Infecting case" suffered from rhinorrhœa up to eleven days before discharge, and from rhinitis after he returned home.

(C) In the following group of cases the morbid condition which was intermittent recurred after the patient left hospital.

(1 Case 220. F. A., aged 5 years, was discharged from hospital 16th November. On December 1st, after an "interval" of 15 days, A. A., aged 6, was taken ill in hospital. While in hospital the "infecting case" had intermittent discharge from the nose which recurred 12 days after he returned home.

(2) Case 378. G. M., aged 5 years, was discharged from hospital on the 25th January. After an "interval" of 16 days, "return case" C. M., aged 3, was taken ill. While in hospital "infecting case" suffered from rhinorrhœa, which had ceased 14 days before she was discharged. After being home 12 days her nose "got sore" and the discharge recurred.

(3) Case 8. "Infecting case" L. S., aged 5 years, suffered from rhinorrhœa while in hospital. She was discharged on the 25th May after a detention of 69 days. On 26th June, thirty-two days later, "return case" E. S., aged 4, was taken ill with scarlet fever, and was followed immediately afterwards by two more "return cases." The "infecting case" was apparently quite well until 14 days after she left hospital. She then complained of a sore throat, and on the following day there was a thick blood-stained nasal discharge, which had persisted for 17 days, when the first "return case" showed symptoms of scarlet fever. The most interesting feature of this recrudescence is that the "infecting case" herself had a definite second attack of scarlet fever, for which she was re-admitted to hospital on August 28th. The "return cases" were still in hospital when the second attack began.

(D) In the following cases, the "infecting case" suffered from a purulent discharge for the first time after leaving hospital. In some of these cases there was some slight rhinitis in hospital. In others, there were no objective signs of this complication but the rapidity with which the purulent discharge appeared, after the patient returned home, suggested that this affection was latent in hospital.

(1) Case 10. C. W., aged 5 years, was discharged from hospital December 2nd. Period of detention 65 days. The day he returned rhinorrhœa appeared for the first time. The discharge was purulent. On December 5th, after an "interval" of three days, his father C. W., aged 33, was taken ill with scarlet fever. On December 14th, C.W. was sent with his sister Nora to his aunt who lived in the country. On December 17th, three days later, the aunt and a playmate, who lived next door, were taken ill with scarlet fever. On December 21st he returned home, and two days later his mother failed with scarlet fever. While in the country, "infecting case" slept with his sister Nora, *who a few days later developed a nasal discharge.* Nora had had scarlet fever two months previously, but had been perfectly well since her discharge from hospital, on November 4th.

(2) Case A. E. W., aged 6 years, was discharged from hospital on the 6th January, after a detention of 55 days. He had no rhinorrhœa in hospital, but on the evening he arrived home, the discharge from the nose stained the pillow case.

The first "return case," K. W., aged 2 years, was taken ill on the 11th January; the next two, K. W. and E. W., aged 7 and 3 years, respectively, on the 13th. After the children were removed to hospital, their father was laid up with a sore throat for 10 days. No rash or peeling was detected.

(3) Case 597. J. O., aged 5 years, was discharged from hospital on the 21st July, after a detention of 46 days. Three days later, "return case" W. O., aged 3, was taken ill with scarlet fever. The "infecting case" had a sore nose in hospital, and also at the time of discharge. On the evening of his arrival at home he had a yellow blood-stained discharge from the nose.

(4) Case B. G. J., aged 5 years, was discharged from hospital on April 13th, after a detention of 41 days. He was sent home by ambulance, and shortly after arrival was put to bed. His nose was sore when he left hospital, but there was no rhinorrhœa. On the following morning he had a profuse yellow discharge, which was followed by a pustular eruption on the face. After an interval of 5 days, his two sisters and one brother, aged 7, 1 and 3 years, respectively, were taken ill with scarlet fever.

(E) **Recrudescence of infection group.**—While in many of the above cases the infection at the time of discharge was probably in an active state, the following instances suggest that this was not the case until some time after the return home of the patient. In most cases, this recrudescence was associated with the presence of a nasal discharge, in others, the "infecting case" suffered from sore throat, cervical adenitis, otorrhœa or a "cold."

(1) Case 439. Eight days after "infecting case" returned home rhinorrhœa appeared for the first time. Three days later, three "return cases" aged 2, 3 and 6 years, were taken ill with scarlet fever on the same day, and after a further "interval" of two days, an infant 9 months, contracted the same disease. The "infecting case" suffered while in hospital from endocarditis, but had no morbid condition of the nose.

(2) Case 235. "Infecting case" F.B., aged 2 years, was discharged on November 6th. After he had been home 21 days he suffered from rhinitis. On November 30th, three days later, his father had an attack of scarlatina sine eruptione, and a sister who had been from home until December 5th, failed with scarlatina on December 9th.

(3) Case 277. Mrs. O., aged 37, after a detention in hospital of 34 days, was discharged on October 25th. She had no complications in hospital. For 37 days after she returned, fresh cases of scarlet fever occurred in her house, and during a portion of this time she suffered from a "bad sore throat." The first "return case" occurred on November 9th, the second on the 17th, and the third on December 1st, at "intervals" of 15, 8, and 14 days respectively.

That these cases represent abortive attacks, possibly analagous to the cases of scarlatina sine eruptione which, I have shown, may on discharge from hospital cause "return cases," is highly probable, for, in some instances, the throat illness is followed by a well marked relapse of scarlet fever, while, in other cases, although no rash was detected, some powdery desquamation followed.

(4) Case 119. E. E., aged 10 years, suffered from nephritis, and was in hospital 75 days. He was discharged on September 11th. The day after he returned he had a sore throat which lasted a week. About ten days later peeling was observed. "Return cases" continued to occur in this house for 25 days after "infecting case" was discharged. The first "return case" was taken ill on September 14th, the second on October 6th, after "intervals" of 3 and 22 days, respectively. There were no other susceptible children in this house.

(5) Case A. M. D., aged 5 years, was discharged from hospital on November 5th, after a period of detention of 50 days. The day after she returned she had headache, sore throat, and slight delirium. Three days later the rash appeared. Three "return cases" followed.

(6) Case B. S. B., aged 4 years, was discharged from hospital on June 18th, after a detention of 43 days. He had a mild uncomplicated attack of scarlet fever. The evening he was discharged he suffered from sore throat and headache. On the following evening he had a definite relapse of scarlet fever and was re-admitted to hospital.

Assuming that the view which I have taken with regard to the above cases is correct, then the question to be considered is whether the occurrence of tonsillitis and other "secondary" complications during convalescence may not also in some instances represent abortive attacks of the disease. The probability of this is suggested by the following cases, and by the fact that in hospital at the same stage of the illness definite relapses of scarlet fever are frequently associated with these complications.

(1) Case 390. F. K., aged 5 years, was discharged on February 3rd. In hospital 86 days. On January 14th, twenty days before discharge, he had tonsillitis and three days later rhinorrhœa which continued for three days only. On January 24th, seven days later, he had otorrhœa which lasted for four days. He had no morbid condition after discharge. But after "intervals" of 2 and 5 days, two "return cases" aged 12 and 8 occurred.

(2) Case B. S. S., aged 5 years, discharged from hospital on 13th October, after 84 days detention. His condition was apparently normal after discharge, but 14 days before he left hospital, he suffered from "tonsillitis." "Return case" K. N., aged 6, who lived in the same house was taken ill after an "interval" of 18 days.

(3) Case 609. G. L., aged 5 years, was discharged on the 15th July, after 57 days detention. She had no morbid condition after discharge, but suffered from adenitis during convalescence. After an "interval" of six days she infected her cousin, H. C., aged 5, who lives in the same house.

Long Interval Cases.—I have already indicated that intervening cases of **scarlatina sine eruptione** may tend to lengthen the "interval." In the following cases, which are taken from some of the preceding groups, there had been no sore throats or any other illness but the "infecting case" either had what appeared to be a recrudescence after discharge, or had no opportunity of meeting the "return case" until some time after leaving hospital. In other cases during the long "interval" the "infecting case" suffered from a chronic morbid condition of either the throat or nose.

I—In addition to "case 235" and some others which I have given, the long "interval" in the following cases was apparently due to a recrudescence of infection.

(1) Case 171. "Infecting case," N. G., aged 5 years, was discharged on the 17th October, after a detention of 54 days. On November 21st, thirty-five days later, "return case" E. G., aged 3, was taken ill. Eight days previously, on November 13th, "infecting case" suffered from a sore nose and slight discharge.

(2) Case 479. "Infecting case," M. S., aged 2 years, was discharged from hospital on the 28th February, after a detention of 130 days. He had a relapse of scarlet fever, and also rhinorrhœa in hospital. Twenty-seven days after he returned, "return case," aged 8, was taken ill with scarlet fever. Five days previously the discharged patient had a severe attack of rhinitis, for which he was re-admitted to hospital.

II.—In the following cases, the "infecting cases" either went from home immediately after leaving hospital, or for some other reason had no opportunity of meeting the "return case" until shortly before the latter was taken ill.

(1) Case A. W. C., aged 5 years, suffered while in hospital from mastoid disease and post nasal discharge. The discharge was present after he left hospital. He returned home on the 29th August, after 83 days detention. Thirteen days later, on 11th September, he visited a relative in a remote part of the country, where, eight days later, that is, 21 days after leaving hospital, he infected his cousin. There had been no cases in this village for several months.

(2) Case B. R. C., aged 19 years, a domestic servant, after leaving hospital, went to her mother's house, where she remained 22 days. She returned to her situation on July 7th. Nine days later, on July 16th, her mistress's children were both taken ill with scarlet fever on the same day. The "infecting case" had a cold in the head while in hospital and rhinorrhœa after discharge. The "interval" in this case was 31 days.

(3) Case C. H. P., aged 6 years, was discharged from hospital on the 24th September, after 62 days' detention. The day after he returned he had a purulent discharge from the nose. On leaving hospital he went direct to the house of his aunt, B. N., aged 33, who thirteen days later, was taken ill with scarlet fever. Next day the "infecting case" was sent home. Five days later, on October 13th, after an "interval" of 19 days, his sister, E. P., aged 9, suffered from scarlet fever. On October 21st and 24th, two more "return cases" were taken ill.

(4) Case D. B. C., aged 6½ years, was discharged from hospital on the 12th December. Seven days later "return case" A. C., aged six months, contracted scarlet fever and died three days later. The day B. C., the "infecting case" left hospital, his brothers A. C., aged 8, and J. C., aged 9, were sent into the country where they stayed for ten weeks. Ten days after returning home, or after an "interval" of 79 days, A. C. suffered from scarlet fever. Two days later his brother, J. C., was ill with the same disease. The "infecting case" suffered

from rhinorrhœa, off and on, during the ten weeks, but his nose did not appear so well the day his brothers came home, consequently he was isolated for the first three days after they returned. The disinfection was carried out most thoroughly and every possible precaution was taken, including the sending of the "infecting case" to the seaside for a fortnight from January 17th.

(5) Case 265. T. J., aged 4 years, was discharged from hospital on the 3rd December. Eight days later he infected his brother, W.J., aged 8, who was the first "return case." Seventy-eight days later, on February 27th, the second "return case," aged 7 months, was taken ill with scarlet fever. This child was not a member of the same family, but lived in the same house. She was only four months old when the "infecting case" returned from hospital, who was therefore not allowed to play with the infant until a few days before she was taken ill. There were no other children in the house and the child was fed on sterilized milk. The first "return case" W. J. rarely came in contact with the baby. He had been back from hospital for 21 days, and had returned to school a fortnight before her illness commenced. "Infecting case" suffered from severe rhinitis at the time of discharge, and for several months after he returned home.

III.—The following long "interval" cases, the "infecting case" suffered from a chronic morbid condition after leaving hospital:—

(1) Case 544. "Infecting case" C. B., aged 4 years, was discharged from hospital on the 12th April, after a detention of 69 days. Thirty seven days later, "return case," who lives in the same house, and occasionally played with C. B., was taken ill with scarlet fever. C. B., the "infecting case" had had a running from the nose and rhinitis, since he had been home, and up to the time "return case" was taken ill.

(2) Case 372. "Infecting case" G. B., aged 5 years, suffered from chronic rhinorrhœa in hospital. She was discharged on the 18th December, after a detention of 98 days. Forty days later, "return case" M. B., aged 4, was taken ill with scarlet fever. The "infecting case" had had a watery running from the nose ever since she returned home.

(3 Case A. "Infecting case' J. C., aged 23 years, was discharged from hospital after a period of detention of eight weeks. Thirty days later, she infected her sister, R. C., aged 16. After "infecting case" was discharged from hospital, she went direct to the sea-side, accompanied by her sister, the "return case." They were constantly together while they were away, but occupied separate beds, until the night they returned home. Two days later "return case" was taken ill. "Infecting case" suffered from rhinorrhœa in hospital, and had an intermittent discharge after she left.

The following cases are instances of long "intervals" between the "return cases."

(1) Case 501. A. L., aged 3 years, was discharged from hospital on April 3rd, after a detention of 82 days. On April the 6th, G. L., aged 7, was taken ill with scarlet fever, and on April 26th, E. L., aged one year and six months. "Intervals" of 3 and 20 days respectively.

The "infecting case" suffered from rhinorrhœa in hospital and a cold in the nose after he was discharged.

(2) Case 413. J. G., aged 4, was discharged from hospital on the 15th February, after 93 days detention. On February 18th the first "return case" was taken ill, and on March 5th the second. "Intervals" of 3 and 15 days respectively.

The "infecting case" suffered from rhinorrhœa and nephritis in hospital, and rhinorrhœa for a month after she was discharged. On returning home, she slept first with her mother, and shortly before the second "return case" was taken ill with the latter.

No. 3. Case 221. F. B., aged 5 years, was discharged from hospital on December 2nd, after a detention of 60 days. On December 5th, A. B., aged 2, was taken ill with scarlet fever, and on January 9th another sister, aged 8. "Intervals" of 3 and 35 days.

The "infecting case" suffered from rhinorrhœa up to 3 days before she was discharged. Her tonsils were enlarged, but her nose was apparently well after returning home.

Conclusions.—The facts ascertained and the conclusions suggested by these groups of cases are:—

I.—That the "infecting cases" which retain their infection longest, are those which suffer from "secondary" complications.

II.—That "infecting cases" which suffer from complications may continue to be infectious long after leaving the hospital environment. Consequently, the separate isolation for a period of ten days before leaving hospital of all cases suffering from mucous discharge, as has been suggested, is likely to prove only partially efficacious, if efficacious at all.

III.—That, while at the time of discharge the infection may in some cases be in an active state, in other cases it is probably quiescent and remains so until some time after leaving hospital.

IV.—That the occurrence of a nasal discharge for the first time after returning home, or the recurrence of the discharge, which had ceased some time before the patient left hospital, is apt to be attended by a recrudescence of infection, and similarly but not so frequently the occurrence after discharge of other complications, such as "sore throat," may also be followed by "return cases."

V.—That the "secondary" complications which occur during convalescence, may at times represent abortive relapses of the disease and be analagous to the recrudescence of infection which takes place after leaving hospital.

XVI.

Coincidences.—Although the evidence which I have submitted shows clearly that the phenomenon of "return cases" is not a mere coincidence depending on infection introduced into the house at or about the time of discharge of the hospital patient, the following cases, which are selected from those classified in this report under Group "B," will show that coincidences do occur, and, however strongly the evidence at first may point to the alleged "infecting case," further enquiry may demonstrate that the "return case" was infected from some other source.

(1) Case 67. The "return case" was taken ill and the rash appeared on the day the "infecting case" was discharged.

(2) Case 75. The "return" and the "infecting" cases lived in the same barracks, but did not meet.

(3) Case 248. Five days after "infecting case" left hospital she visited a house and nursed two children suffering from scarlet fever. On that day she wore an astrakan trimmed coat and a fur boa with which the children played. On returning home she nursed the "return case" who also wore the boa, and at night the coat was used as a bed covering. Five days later "return case" was taken ill.

(4) Case 421. The alleged "infecting case" was admitted to hospital January 13th, and was discharged on February 27th. Subsequent to her removal a series of cases occurred in this house at the following "intervals" after each preceding case namely, 2, 15, 13 and 20 days. The last case, who was the "return case," was taken ill six days after the "infecting case" was discharged. The source of infection was an unrecognised case in the same house.

(5) Case 521. C. H., aged 8 years, was discharged from hospital on March 19th. On April 24th thirty-six days later, "return case" M. H., aged 10 weeks was taken ill with scarlet fever. The mother of the "infecting case" was confined on February 15th. On March 10th, nine days before "infecting case" was discharged, she noticed she was "peeling all over," but attributed it to "milk fever," as about that time she had been feeling ill. There were no other children in this house.

XVII.

The Etiology of Return Cases.

Home Treated Cases.—To what extent "return cases" are dependent on hospital conditions and what is the nature of the infection associated with their origin are questions of first importance, though difficult to elucidate, and in neither case is the available evidence conclusive.

There is evidence that "return cases" do occur in connection with patients treated at home, but compared with the number arising in connection with hospital treated cases, they appear to be rare. This is worthy of note, in view of the fact that in home treated cases, the period of isolation is usually short—about 6 weeks—for one might suppose that, ceteris paribus, in some of these, as in hospital treated cases, the period of infectivity would be prolonged, and that unprotected children who had escaped the infection at the time of onset of the first illness would contract the disease after the period of home isolation was completed.

Of course, all the unprotected children who are exposed to infection, would not necessarily suffer from the disease. This is shown in Table 45, which records those "return cases" arising in connection with hospital treated cases. But the following table shows, that during a period of one year (1901) in 358 houses where cases were treated at home, no further cases occurred after isolation was declared over. From this it may be argued, that all the susceptible material was exhausted before the completion of quarantine, but such a suggestion is at least improbable, as on examining the table more closely it will be seen that out of 351 children unprotected by a previous attack, and therefore presumably susceptible, there were only 69 secondary cases, and that only one case occurred after a longer interval than 31 days from the onset of illness of the primary case. There is, therefore, strong presumptive evidence that these 427 patients were free from infection when discharged, for, as Dr. Niven remarks, "the number of infections (nearly 69) *prior to recovery* cannot at all be supposed to have destroyed the power of the recovered cases to infect the remaining 282, if they possessed any such power."

TABLE 59. *HOME TREATED CASES.

Primary cases recognised but treated at home.	Susceptible persons under 15 remaining.	Total number left.	Households subseq'ntly attacked.	Number of subsequent cases.	Number occurring within—days of the first case when left at home.					
					—8 days.	—14	—21	—31	—41	42 and upwards.
358	351	1484	52	69	52	9	3	4	1	0

* Report of the Health of the City of Manchester, 1901. Page 56.

On the other hand Dr. Charles V. Chapin, Superintendent of Health, of the City of Providence, U.S.A. (*vide* Public Health, Vol. 8, November, 1895), shows that in that city, where the patients are treated at home, in some households the unprotected children are sent away until the period of isolation is over.

On the return of 317 of these children, who were at once removed from the houses where the outbreaks of scarlet fever had occurred, 18 were attacked.

In the only two cases of this kind which I have met with in the course of this enquiry, the period of isolation counting from the date the rash appeared to the date of discharge was about five weeks. The "interval" was also a short one.

The details in connection with these two cases are as follows:—

(1) Case 442. M. G., aged 15, was quarantined at home for five weeks. A few days after she was discharged she infected her sister, K. G., aged 14.

(2) Case 14. In this case the infection was contracted in hospital, so that, strictly speaking, it is not a home "return case," but the particulars are as follows:—H. H., aged 9, was admitted to hospital, suffering from diphtheria. On November 25th, he had a slight erythematous rash. On December 23rd he was discharged from hospital. On the following day desquamation and some nasal discharge were observed.

From this day he was isolated for a period of 3 to 4 weeks. Within 3 days after quarantine, December 31st, H. C., aged 6, contracted scarlet fever. About two weeks after the period of quarantine, some rhinitis was still present.

There were no other susceptible children in this house.

On the whole, therefore, the evidence tends to show that the phenomenon of "return cases" is not essentially a hospital phenomenon. Still the frequency with which they are associated with hospital treated cases, the special age incidence of the "infecting cases" (5 to 10 years) and the high mortality of "return cases" as compared with "all cases," together with the apparently prolonged period of infectiousness of hospital patients as compared with that of those treated at home, suggest that there are conditions in hospital which are probably only exceptionally, if ever, met with in home isolation.

Hospital Treated Cases.—The suggested cause of hospital "return cases," and the conditions which tend to prolong the period of detention of patients treated in hospital.

To differentiate between the hospital and home conditions and to explain the nature of the infection to which "return cases" owe their origin, it has been suggested that *the prospective "infecting case" derives from the acute cases and accumulates in his nostrils extraneous infection which he may transmit after he leaves the hospital environment.* The supporters of this theory regard "return cases" as essentially a hospital phenomenon, and consider that if there be any connection between the nasal discharge and the continuance of infectiousness, the discharge can only be of secondary importance.

Professor Simpson in his report to your Board on "return cases" of scarlet fever laid great stress on the presence of nasal discharge, but arrived at practically the same conclusion with regard to the origin and nature of the infection.

Thus, on page 17 of his report, he states "that these and similar cases do not represent an infection belonging *per se* to the patient, but rather an infection attached to the surroundings and engrafted on the patient." Referring to the mucous discharge he further points out, that the infection—the causal micro-organism—appears to acquire activity particularly on the mucous discharges, whether acute or chronic, but further than acting as suitable media for their growth and carriers of any possible infection that may come in contact with them, the discharges do not appear to possess infectious properties of themselves. On page 45, he also remarks that "if the secretion dries up, there is no longer the medium on which the micro-organisms can engraft themselves, so that the patient becomes non-infective; but if the discharge continues, then it depends whether the patient remains in an infective ward . . . . as to how long the infection will remain."

Consequently he concluded (page 24), "that long detention in infective wards will not reduce the percentage of 'return cases.'"

The two views agree in regarding neither the patient himself nor his mucous discharge as the active generator of infection. They differ in so far that in one the mucous discharge plays but a secondary part, while in the other it is an essential factor. But as patients long detained in hospital not only have the best opportunities for passively accumulating infection, if infection can be so accumulated, but also suffer most from mucous discharges, it follows that whichever of these two views be taken, the patients most apt to retain infection after discharge and to convey it to others, should be those detained in hospital the longest. And all things being equal, the relation between the length of detention of patients and their aptness to carry infection should be perceived at all hospitals and should operate with consistent results. But the facts are not so. And these hypotheses of accidental or accumulative infection fail to explain (1) the origin of home "return cases"; (2) the higher mortality of "return cases"; (3) that "infecting cases" discharged after a period of detention of from 8 to 12 weeks, display a greater virulence of infective power than do those discharged at any other period; (4) that irrespective of the number of patients under treatment, some hospitals for considerable periods may be free from "return cases"; (5) that only comparatively few discharged patients cause "return cases," for if the origin of "return cases" is to be sought in a mere passive storage of infection, it would seem probable that under similar conditions of treatment a large proportion of patients would become carrying agents; (6) that, since in convalescent hospitals the patients have no opportunities of absorbing infection by contact with acute cases, these hospitals are not free from "return cases."

An alternative explanation which has been advanced, is, *that the "infecting case" at the time of discharge has not eliminated his own infection derived from his original attack, in consequence of the process of elimination being retarded by the surcharging of the atmosphere with infection, by the aggregation of patients.*

That "return cases" are due to defective elimination—although I have shown that in some cases the discharged patients may be merely "passive agents" or carriers of infection—appears to me to be consistent with the clinical course of the disease, and to be borne out by the statistical and other evidence which I have brought forward.

I have also arrived at the conclusion that the aggregation of patients whether in the acute or convalescent stage, is probably an important factor associated with hospital "return cases," but its effect I believe depends within certain limits on the type of cases under treatment, and also upon the season of the year, and not as has been suggested on any atmospheric condition of the ward.

For, in my opinion, in wards efficiently ventilated, where the floor space allowed for each patient does not vary with the demand on the accommodation, it is at least improbable that the atmosphere could become so vitiated as to aggravate the infection or retard its elimination. Moreover it is certainly quite contrary to my experience that home treated patients, which, as already pointed out, are comparatively rarely associated with "return cases," are placed under more favourable conditions with regard to ventilation, than hospital patients.

It is my belief that as long as the cases are mild and the weather sufficiently favourable to admit of the convalescent patients being kept out of doors, even where conditions which are not altogether desirable exist, no ill effects may follow the aggregation of patients, unless severe cases, and cases complicated with discharges are admitted to the ward.

In the smaller sanitary districts where the admissions may be uniformly mild for a considerable period, the effect of any sudden change in the type of the disease is more readily observed than in cities where the wards are seldom free for any length of time from complicated cases. An instance of this I had an opportunity of observing. During the summer months there had been considerable strain on the hospital accommodation. The cases, however, were mild, and the convalescent patients spent most of their time out of doors, and although the period of detention was unusually short, there were no alleged "return cases." This state of things continued for three or four months, when additional accommodation was provided, and the pressure in the wards was relieved by distributing the patients. Within a short time after the opening of the new wards, two severe cases were admitted—one with a necrotic throat—and this case was placed next to a convalescent child who had been in hospital three or four weeks. A few days later this child had a fatal relapse, and on the day the rash appeared, physical signs of pneumonia were present. "Return cases" followed the discharge of patients from the ward.

Now, although there may be some other explanation to account for this, yet it is my belief that the infection in this case was of a septic nature, a recrudescence or relapse being the result, and it appears not unlikely that the chief distinction between hospital and home treatment is the facility with which, in the former case, septic infection may be conveyed either directly or indirectly from one patient to another.

That the complications which are chiefly associated with the occurrence of "return cases" and which tend to protract the period of infectiousness are the result of mixed infection has been suggested to me by my investigations.

That they are in some way increased by aggregation is almost certain, but in the absence of statistical proof the question must remain sub-judice, although the weight of medical opinion, I believe, supports the view that complications are more common among patients treated in hospital than among those treated at home.

In Allbutt's system of medicine, Vol. 2, Dr. Foord Caiger draws attention to the effect of overcrowding (or aggregation, which is only a question of degree) on the incidence of secondary tonsillitis and kidney affections. On the subject of adenitis during convalescence also he remarks that "these cases of adenitis are often seen to arise in groups about the same time in patients "located in different parts of the hospital," and adds "that their occurrence in groups appear to "suggest some widespread causative influence," &c.

The cause of these complications and the explanation of the grouping is, I believe, elucidated by Dr. Gayton, who, in his observations on Professor Simpson's report on "return cases," remarks "that otorrhœa and rhinorrhœa are propagable, and very important for consideration, is proven by "the fact that given a case of either kind, not infrequently it is communicated, not only to patients "in immediate contiguity with the one affected, but to others in remote parts of the ward."

Dr. Niven has also observed, "that it sufficed to take patients into a ward not recently used "to diminish the incidence of such complications as rhinitis, otorrhœa, cardiac affections and "nephritis." (*Vide* Public Health Report, 1900, page 28.)

It is my belief, although I am unable to produce statistical evidence in support of it, that patients treated in old wards suffer more from complications than those under treatment at the same time in wards constructed on modern principles. This has also been the experience at the new Isolation Hospital, Wimbledon, which was opened in December, 1900.

Dr. E. Clapham, Medical Superintendent of the hospital, informs me that secondary complications were undoubtedly more prevalent in the old hospital, and he is convinced that in this district, where he has been in practice for a number of years, "complications occur more frequently "in hospital than in private practice, and that so far as the individual patient is concerned when "treated at home, the period of convalescence is shortened."

If the views of Medical Officers in positions similar to that of Dr. Clapham were ascertained, valuable information might be obtained on the subject of both home and hospital "return cases," and in my opinion, it is in this direction that future enquiry should be made.

If the foregoing observations are correct, it follows from the evidence which I have adduced elsewhere that the limitation of "return cases" lies in the direction of preventing the spread of complications in hospital.

With regard to the time when patients receive this superadded infection it is probable that it may take place at any period during their stay in hospital, but my impression is that the infection occurs most frequently in the acute stage soon after admission, although it is difficult, if not impossible, to say whether the complications which arise during the course of the illness are due to infection present at the time of admission, or received subsequently.

But in the early stages of the illness it may be observed that a throat only moderately inflamed on admission, may after a few days suddenly assume an appearance of marked severity, and even become necrotic, suggesting the presence of superadded infection. Again, during convalescence it may be noticed that, without any apparent exciting cause, patients who had up to that time a mild attack of scarlet fever may suddenly develop secondary complications. To my mind, the stage of the illness in which they occur (the second, third and fourth weeks, corresponding to the time when the patients are allowed out of bed), and their frequency cannot be explained by the assumption that in every case, or in the majority of the cases, the secondary complications are due to infection present at the time of admission.

Usually two or more complications occur at the same time, suggesting a common origin.

The following illustrates one of these cases of secondary infection during convalescence.

Case 390. F.K., aged 5, was discharged from hospital on February 13th, after a detention of 68 days. He had a moderate attack of scarlet fever, but on January 14th he suffered from tonsillitis. On January 17th, rhinorrhœa, and seven days later otorrhœa occurred. These complications lasted only a few days. On discharge from hospital his condition was apparently normal, but he infected two "return cases."

Another type of case which also is not uncommon is that in which the patient, on arrival home, suffers for the first time from a purulent discharge from the nose. On enquiry, it is not unusual to find that he has had a mild and uncomplicated attack of fever, but that he was noticed to pick his nose, and that it became sore three or four days before leaving hospital. Harmless as these cases may appear at the time of discharge, they are as virulent as any other type of "infecting case," and have caused as much trouble as any others which I have investigated. The explanation of the discharge from the nose is, I believe, the inoculation of the septic material on the broken and inflamed mucous membrane, and the increased infective virulence the effect of the mixed infection.

The view suggested to me by my investigations is that in patients convalescent from scarlet fever, the infective agent may lead a saprophytic existence, not in the discharge, but in the mucous membrane, and in cases where the soil is suitable may maintain its vitality for a lengthened period. In most cases the soil soon becomes unsuitable, and the infection dies out. But just as the bacillus of tetanus, which cannot grow in healthy human tissues, has that power in tissues devitalised by injury or inflammation, so I believe the infection of scarlet fever has the power of existing for an indefinite period when the vitality of the mucous membranes is impaired either by a general lack of vigour in the patient or by a local superadded septic infection.

If this be the case, clearly it is not essential to the infectiveness of the patient that he should exhibit a morbid condition of the mucous membrane, provided that his general vitality is low. And we do, in fact, find that some "infecting cases" show no sign of local disease. Nevertheless, we should expect to find, as we do find, a morbid condition of the mucous membrane present in most cases. Again, the presence of an actual discharge should not be essential to the patient's infectiveness. Nor is it. But it is easy to understand how a discharge may assist in distributing the infection.

If this view be correct, the part played by a superadded septic infection can hardly be exaggerated. The septic organisms may, in some cases, have been already acquired by the patient before his admission to hospital, fastening on a throat weakened by the scarlet angina. In other cases it cannot be doubted that they are conveyed to the patient after admission to hospital, either directly from other patients, or indirectly by attendants, toys, utensils or dust. Such infection may occur soon after admission to hospital and complicate the acute attack of scarlet fever, or may not occur until the patient's convalescence. The effect produced will vary with the case. In healthy adults with resistant mucous membranes no harm may be done. In more weakly children, either at once, or perhaps after an interval, and under the influence of depressing agencies such as exposure to cold or rapid variations of temperature, as may occur after the warm bath in winter, the septic organisms become active in the mucous membranes, and the vital resistance of the latter is thereby still further lowered. In that way, in a case in which the elimination of the scarlet fever infection was almost complete, it might cause in the mucous membrane an actual re-infection with scarlet fever from the outside. And in the latter case, if the patient had lost, or partly lost, the immunity conferred by the first attack, he might fall a victim to his own re-infection and develop a second attack.

These speculations seem to receive confirmation from many facts detailed in this report. And granting the hypothesis, we see why return cases are so much more liable to be severe, and to be attended with a higher mortality. For if the "infecting cases" in general retain their infection of scarlet fever because the mucous membranes are infected also with septic organisms, they will be liable to pass on the one infection when they convey the other. The infected cases will be admitted with the double infection, and such patients make notoriously bad cases.

If the evil of return cases is caused by the factors suggested, the remedy must lie in two directions. On the one hand, the patient must be placed under such hygienic conditions as conduce to the rapid renewal of a general bodily vigour. On the other hand, he must be guarded from those secondary infections which seem to play such havoc, and from the factors which predispose to them.

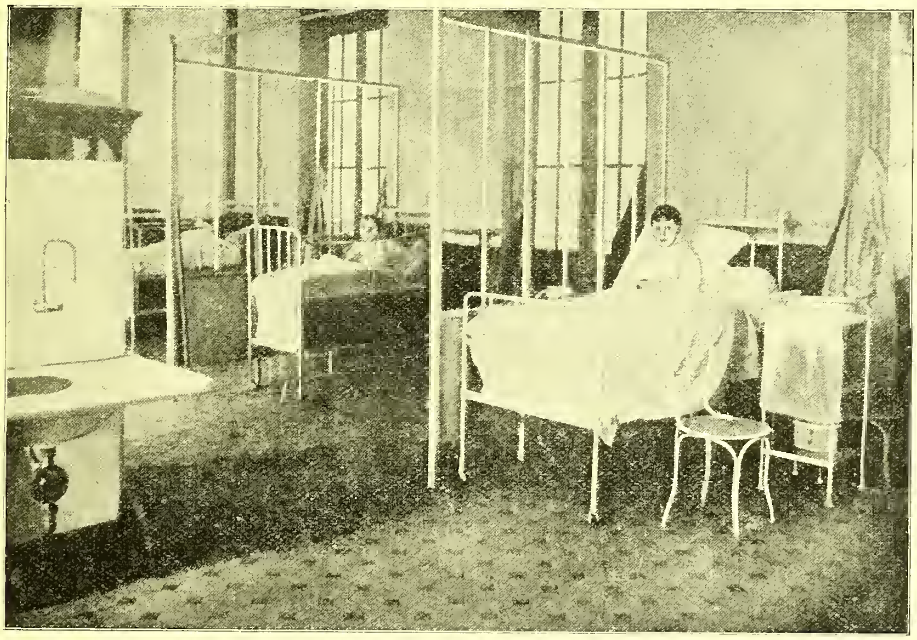
XVIII.

Prophylactic Measures.—The lines upon which measures for the prevention of "return cases" should be carried out must necessarily depend upon the opinion held with regard to the origin of the infection. If it is still believed that the phenomenon of "return cases" is a *part of the natural history of the disease,* in no way or only exceptionally dependent on hospital conditions, then I have no suggestions to offer except that, since mucous discharges so frequently follow the discharge bath it would be well to consider the desirability of discontinuing, especially in the winter months, the practice of giving a warm bath on the day they leave the hospital to those patients predisposed to or who have suffered from this discharge. If the bath were given on the evening *prior to discharge* and the patient then put into clean sheets and the hair protected by some form of cap, then, even if no discharge ward were provided, the risk of causing a "return case" would I believe be lessened, as in my opinion, the possibility of setting up a recrudescence in these particular cases, quite outweighs the supposed advantage of the bath immediately before the patient leaves the hospital.

If on the other hand "return cases" are held to be in some way influenced by hospital conditions, and to be due to *accidental infection*, as suggested by Professor Simpson, then the acute and convalescent patients should as far as possible be kept apart, and the patients for discharge should be passed through a series of convalescent wards which should be disinfected at regular and short intervals. Patients who suffer from mucous discharges might also be isolated separately before leaving hospital, but such isolation, if it is to prove efficacious, should be for a period of not less than one month, during which time the ears and nose of the patient should be douched night and morning, in order to remove all extraneous infection engrafted on the discharge.

But should the theory of *defective elimination*, as I have suggested, be accepted as the correct one, separate isolation should be commenced from the time of admission, with a view to the further observation of the patients and a subsequent classification of cases.

After a probationary period of a fortnight or three weeks in the admission cubicles, it might then be safe to transfer the uncomplicated cases to the general wards as is done in the present system, but the complicated cases should either remain in these cubicles until they have recovered, or, if more convenient, they might be transferred to wards partitioned off in such a way as to prevent the patients from coming into contact with one another, as shown in the accompanying photograph which has been reproduced by kind permission of Professor Grancher. The same antiseptic precautions to be described later should nevertheless be carried out as in the admission cubicles.



Vue du nouveau pavillon de la rougeole et de ses box ouverts, sans porte et sans plafond. Chaque enfant occupe ainsi une chambrette dans la salle commune.

Ward in the Hôpital des Enfantes Malades, Paris.

Whenever possible all cases suffering from mucous discharges should be sent to the convalescent hospitals. Here they should be isolated and the same antiseptic precautions observed as in the acute hospitals. As for the chronic cases of mucous discharge, if some form of outdoor treatment could be put into practice I believe it would be attended with good results.

To carry out this system efficiently, for otherwise it would have very little advantage over the present one, more individual attention would have to be given to the patient, not only during the acute stage of the illness, but during convalescence.

This of course would necessitate additional medical and nursing staff, but the increased expenditure, I believe, would be more than compensated for by the reduction in the period of detention, in the number of "return cases" and of superadded infections.

The system of separate isolation of infectious diseases is not new. On the Continent and in America it has been practised for some years. In the Bulletin de la Soc: Méd des Hôpitaux, 7th June, 1900, M. Moizard gives his experience of this treatment, and describes one of his wards as follows:—

The ward "Henri Roger," measures 30 by 7 metres, and is 4 metres 50 high. It was formerly a general ward used for the treatment of non-infectious diseases, and has been adapted for the isolation of doubtful cases in connection with the "Hôpital des Enfantes Malades." It is divided into 20 cubicles—10 on each side—by glass partitions. In the outer wall of the cubicle is a large window – the other three sides are constructed of glass, fixed in frames. The height of the partitions which are fixed to the floor by iron frames is 2 m 10, and the space between the frame and the floor 5 centimetres.

In each cubicle is a glass door opening into the central passage. As the walls are plastered and varnished they can be easily washed, and to avoid the accumulation of dust, the cracks in the flooring have been filled up. The cubicle has no ceiling, and as the partition does not come down to the floor, there is a free circulation of air, and the heating of the ward which is done by means of hot air stoves is thus facilitated.

In addition to the bed there are two chairs and a table. Each patient has his own spoons, forks, glasses, etc., and at certain times of the day these are collected and sterilized.

When the patient is discharged the bed and bedding are disinfected, the furniture in the cubicle, the floor and the partitions are washed with an antiseptic solution.

In each cubicle are two or three overalls, and on the table is a solution of Perchloride of Mercury—1 in 1,000. On going into the cubicle, each person before approaching the patient puts on the overall, and before leaving, dips his hands into the disinfectant. The gown is then taken off and left hanging in the cubicle.

With these precautions, M. Moizard states that he is able to go from a case of scarlet fever to one of diphtheria, and then to a non-infectious case, feeling confident that he will not carry infection.

In the Hôpital des Enfants Assistés, the beds in some of the wards are separated only by glass partitions, that is, these wards differ from the wards just described, in that they are open in front. The same antiseptic precautions are carried out with apparently successful results.

In a paper, from which the photograph shown was taken, entitled "Un Service Antiseptique de Médicine Statistique de Dix Années" which was read before the 13th International Congress, held in Paris in 1900, Professor Grancher also gives his experience, and strongly advocates this system of cellular isolation.

In the Pasteur Hospital the principle of isolation is the same, but as the hospital was specially built for the separate isolation of infectious diseases, there is some difference in the construction of the wards. The partitions are carried up to the ceiling and reach down to the floor, so that each cubicle is completely closed in. The cubicles are warmed by hot air, and are provided with a hot and cold water service. The wards appeared to me to be bright, well lighted and ventilated, and the nurses apparently had no difficulty in supervising their patients. In these wards, all the usual zymotic diseases, including smallpox, as well as patients admitted with miscellaneous complaints, are treated side by side, and, although the same nurses attend first one patient and then another, there would appear to have been practically no interchange of infection.

This is also the experience of Professor Bézy of the Faculté de Toulouse, and also of others who have tried the same system.

In the hospital for the treatment of Scarlet Fever and Diphtheria, New York, the same strict antiseptic precautions are practised. "Each patient has a private room, there being no wards. Patients are carefully examined before being admitted, and if there is any question in regard to diagnosis, they are placed in the observation room. The resident physician, before entering the presence of the patient, is required to wash his hands thoroughly with soap and water, followed by immersing them in bichloride solution, 1—2,000. A gown is supplied which buttons closely round the neck, covering the collar, and enveloping the body completely, just clearing the floor. To this is added a cap, arranged to cover the head and neck, exposing only the face. This, with a pair of rubber over shoes, completes the uniform. When he leaves the patient, the hands and face are disinfected thoroughly, and the mouth is cleansed with boric acid solution. All visitors must obey the same regulations."

On the day of discharge and for a week before leaving the hospital, an elaborate system of baths is carried out, and the ears and nose are irrigated with an antiseptic solution. "In this hospital there has been no history, as far as known, of contagion from a discharged patient." (vide Nothnagel's Encyclopedia of Practical Medicine).

CONCLUSIONS TO PART I.

To recapitulate, the chief facts ascertained and the conclusions suggested in this report are as follows:—

(1) That during the thirteen months ending July 31st, 1902, there were 688 alleged "infecting cases," which, calculated on the total number of patients discharged, gives 4·1 per cent.

(2) That of the alleged "infecting cases" 46·5 per cent. appeared to cause "return cases." In 36·9 per cent. the evidence was not sufficiently conclusive to enable me to arrive at any definite decision. In the remaining 22·5 per cent., the "return cases" apparently had some other origin.

(3) That after the discharge of the alleged "infecting cases," in 46·8 per cent., the first "return case" was taken ill within an "interval" of one week; in the second week in 26·5 per cent., in the third week in 11 per cent; after an "interval" of eight weeks "return cases" practically ceased.

(4) That the period of detention of the "infecting cases" was practically the same as for "all cases."

(5) That among the patients discharged under 8 weeks and over 8 weeks, the proportion of "infecting cases" is the same, but of the latter patients, those detained the longest give the best results.

(6) That the number of "infecting cases" at the Acute Hospitals is not appreciably influenced, if influenced at all, by the transfer of patients to the Convalescent Hospitals.

(7) That the results of the Convalescent Hospitals compare favourably with those of the Acute Hospitals.

(8) That "return cases" occur at all months of the year, but more especially from November to April.

(9) That the increase during these months does not correspond to a reduction in the period of detention.

(10) That this increase is not a mere coincidence dependent on outside sources of infection. This is shown by the fact that the largest number of "infecting cases" occurred at the time of least epidemic prevalence, and the converse also holds good. Moreover, the increase in the number of "return cases" commences somewhat suddenly and ends with equal abruptness.

(11) That it is not due to a laxity of vigilance in connection with the discharge of patients. This is shown by the fact that the largest number of "infecting cases" did not occur at the time when the daily average number of patients under treatment was greatest, or during the months of maximum discharges—the time when the strain, if any, on the administration would be greatest.

(12) That during the months from November to April, when the largest number of "return cases" occurred, the "infecting cases" suffered from mucous discharges after leaving hospital, much more frequently than during the remaining months.

(13) That between the ages of from 5 to 10 years, patients carry home infection more frequently than at any other age period.

(14) That between the ages of from 5 to 10 years, the largest proportion of "infecting cases" suffer from morbid affections of the nose.

(15) That adults who seldom suffer from nasal affections after discharge, cause "return cases" on comparatively few occasions.

(16) That, compared with "all cases," an unduly large proportion of "return cases" are children under 5 years of age.

(17) That the mortality of "return cases" was 5·8 per cent., as compared with 3·6 per cent. for "all cases," and that this higher mortality affected all ages, increasing with the age of the patient.

(18) That the increased virulence of the "infecting case" is not due to prolonged residence in hospital. This is shown by the fact that patients discharged after a detention of ten weeks and over, cause a lower mortality than those discharged before this period.

(19) That 5 per cent. of the total scarlet fever admissions contracted an infectious disease other than the one for which they are admitted, and that the average period of detention of such cases was 98·7 days, as compared with 64·5 days for "all cases."

(20) That, so far as I am able to judge from the extent of my enquiries on this point, it is my belief that home disinfection has not any appreciable influence on the number of "return cases."

(21) That apart from their condition on discharge, patients who suffer from complications in hospital are more prone than uncomplicated cases to cause "return cases," the effect of these complications being to prolong the period of infectiousness.

(22) That the complication most frequently present after discharge is a morbid condition of the nose.

(23) That patients may continue to be infectious for some time after the objective signs of these complications have disappeared.

(24) That patients suffering from a morbid condition of the nose, may continue to be infectious long after removal from the hospital environment. Consequently, separate isolation of these cases for a period of ten days before leaving hospital, if efficacious at all, can be so only to a limited extent.

(25) That, while at the time of discharge, the infection may in some cases be in an active state, in others it is probably quiescent, and remains so for some time after leaving hospital.

(26) That the occurrence of a nasal discharge for the first time after returning home, or the recurrence of the discharge which had ceased some time before the patient left hospital, is apt to be attended by what appears to be a recrudescence of infection, and similarly the occurrence after discharge of other complications such as tonsillitis may be followed by "return cases."

(27) That the secondary complications, which occur in hospital during convalescence, may at times represent abortive relapses of the disease and be analagous to the recrudescence of infection which takes place out of hospital.

(28) That patients discharged with otorrhœa, except when a morbid condition of the nose co-exists, are but seldom associated with the occurrence of "return cases."

(29) That the discharge from the nose is not necessarily infectious *per se*, but in a very large proportion of the cases its presence, especially when purulent, is an almost certain indication that the patient is infectious.

(30) That late desquamation cannot be regarded as evidence of infectiousness.

(31) That, in the majority of cases the "return case" appears to be due to a delay in the process of elimination of infection in the "infecting case" and consequently "return cases" are due to premature discharge, although in point of time, the proportions of "infecting cases" and "all cases" discharged under 8 weeks are the same.

(32) That the direct cause of the retardation is probably due chiefly to infection by sepsigenic organisms to which aggregation predisposes.

(33) That for patients predisposed to, or who have suffered from, mucous discharges in hospital, the omission in the winter months of the warm bath immediately before discharge and the substitution of one on the previous evening, would tend to lessen the number of "return cases.'

(34) That it is impossible, under the present conditions of hospital treatment, to avoid the occurrence of "return cases." But that with more extended means of isolation than at present obtain, combined with asepsis, a reduction, perhaps a considerable reduction, in their number would result, and the number of complications, as well as of "superadded diseases," which together constitute the chief cause of prolonged detention, might be considerably lessened.

Part II.

DIPHTHERIA.

"RETURN CASES" OF DIPHTHERIA.

During the twelve months ending July 31st, 1902, 6,866 recovered diphtheria patients, and 15,501 scarlet fever patients, were discharged from the Board's hospitals.

After intervals varying from one to thirteen weeks, after the discharge of these patients, there were 142 fresh outbreaks of diphtheria in the homes to which the patients returned.

In 73 instances the alleged "infecting cases" suffered from diphtheria; in 14 from diphtheria and scarlet fever (mixed infection), and in 55 from scarlet fever only.

It will thus be seen that out of 142 cases, 69, or nearly half of the "infecting cases," were discharged from the scarlet fever wards.

The 87 "infecting cases" which suffered from either diphtheria alone or the mixed infection, are equivalent to 1·2 per cent., calculated on the total diphtheria discharges, the remaining 55 cases to ·35 per cent., calculated on the total scarlet fever discharges.

I.

In the following Table 1 and the subsequent tables, the 87 "infecting cases" are dealt with separately.

In Table 1, the sub-division into three groups, A, B, and C, is the same as adopted in my report on "return cases" of scarlet fever.

The figures are as follows:—

TABLE 1.

Classification.	A.	B.	C.
No. of cases (87)	24	29	34
Percentage of ditto	27·5	33·3	39·
Percentage on total discharges ...	·34	·42	·48

In the above table it will be observed, that in one-third namely, Group B, of the cases there was sufficient evidence to show that the alleged "infecting cases" were not the cause of the "return cases." That in more than one-third, the evidence was of doubtful nature, and that the remaining cases (27·5 per cent.) the "return cases" were probably infected by the discharged patient.

II.

In Table 2, the "interval" which elapsed between the discharge of the "infecting" case, and the onset of illness of the *first* "return case" is given.

TABLE 2.

	Under 1 week.	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12	12–13	Total.
No. of cases (87)	26	26	13	12	6	2	—	1	—	—	—	—	1	87
Percentage of ditto	29·88	29·88	14·94	13·79	6·89	2·29	—	1·14	—	—	—	—	1·14	

An examination of this table shows that 29·8 per cent. of these cases occurred within an interval of one week, and exactly the same proportion in the second week. In the third and fourth weeks about half the number recorded in the two previous weeks. In the fifth week there were six cases, or half the number in the previous week.

After this period only four cases occurred, viz.: two in the sixth week, one in the eighth, and one in the thirteenth week.

It will be observed that whereas 73 per cent. of the scarlet fever "return cases," were attacked within the first fortnight after the alleged "infecting cases" were discharged, only 59·7 per cent. of the diphtheria "return cases" occurred within the same time.

Table 3.

Table showing, for each hospital, the number of patients discharged each month. "*All Cases.*"

PERIOD.	E.H.	S.E.H.	N.E.H	W.H.	S.W.H.	N.W.H.	P.H.	B.H.	G.H.	F.H.	G.F.H.	N.H.	Total.	Average period of detention.
August, 1901 ...	82	18	30	54	14	68	43	51	150	...	...	55	565	53·59
September	83	18	29	33	18	54	77	65	179	...	...	52	608	59·63
October	75	64	62	42	45	76	85	72	127	...	...	69	717	53·83
November	78	55	50	59	25	66	61	70	127	...	...	48	639	54·30
December	75	43	54	44	50	89	66	70	136	...	..	39	666	57·50
January, 1902 ...	65	41	73	62	37	39	51	62	155	...	...	54	639	63·28
February	80	36	44	48	31	70	39	36	79	...	...	10	473	64·10
March	79	47	64	62	40	51	35	51	88	...	...	1	518	60·12
April	65	20	73	70	46	62	18	76	94	...	...	5	529	59·24
May	35	59	73	61	28	74	40	55	99	...	...	34	558	57·86
June...	45	49	43	44	29	59	30	53	62	...	...	30	444	55·15
July...	54	68	45	59	50	69	28	55	44	...	...	38	510	52·94
Total	816	518	640	638	413	777	573	716	1340	...	...	435	6866	57·55
Average period of detention ...	60·51	62·29	51·35	56·37	55·10	50·21	51·23	58·64	60·29	...	...	71·01	...	...

TABLE 4.

Table showing, for each hospital, the average period of detention (in days) of "All Cases" discharged each month.

Peroid.	E. H.	S. E. H.	N. E. H.	W. H.	S. W. H.	N. W. H.	P. H.	B. H.	G. H.	F. H.	N. H.	G. F. H.	Total.
August, 1901 ...	56·32	49·11	37·83	52·09	47·21	41·	46·27	51·62	59·45	...	69·83	...	53·59
September ...	61·96	78·55	44·03	55·72	55·55	52·62	60·44	59·07	58·21	...	73·82	...	59·63
October ...	52·26	65·62	43·10	53·52	52·24	56·05	38·63	53·32	57·01	...	67·26	...	53·83
November ...	52·37	58·43	47·84	53·52	54·04	51·75	44·	52·78	59·81	...	67·68	...	54·30
December ...	60·94	55·06	46·88	57·06	56·06	44·62	46·84	56·69	68·22	...	80·20	...	57·50
January, 1902...	67·13	66·07	55·02	57·48	67·16	50·30	59·90	58·80	65·30	...	83·59	...	63·28
February ...	68·83	74·27	51·04	62·45	64·16	53·69	57·53	67·22	70·60	...	90·30	...	64·10
March	63·25	70·29	53·79	58·32	53·10	54·60	60·65	63·27	61·73	...	95·	...	60·12
April	67·89	60·20	58·23	66·45	56·73	54·60	59·05	53·56	56·76	...	88·20	...	59·24
May	65·88	65·98	56·54	56·90	57·21	47·44	56·37	67·60	52·72	...	64·	...	57·86
June	54·93	54·79	54·79	50·18	55·13	48·23	50·60	68·83	55·16	...	57·93	...	55·15
July	55·29	54·67	53·77	49·05	43·68	50·49	49·89	61·25	50·56	...	61·23	...	52·94
Average ...	60·51	62·29	51·35	56·37	55·10	50·21	51·23	58·64	60·29	...	71·01	..	57·55

III.

On referring to Table 3, it will be seen that the largest number, 717, of patients was discharged in the month of October and the least, 444, in the month of June. In the first three months covered by this report, 1890 patients were discharged, in the next three months (November to January), 1944 cases. In the last two quarters (February to April and May to July) 1520 and 1512 cases, respectively.

The largest number of cases were discharged from the Grove and Eastern Hospitals, 1340 and 816, respectively; from the North-Western and the Brook Hospitals, over 700 each, from the North-Eastern and Western-Hospitals, over 600 each, from the Park and South-Eastern Hospitals over 500 each, and from the South-Western and Northern Hospitals over 400 each. No diphtheria patients were discharged from the Fountain Hospital.

It will be seen, on examining Table 4, of the total number of diphtheria patients discharged, that the average period of detention is 57·5 days. In nine months of the year the average period of detention varied from 52·9 days in July to 59·2 days, in the remaining three months from 60·1 days to 64·1 in February.

In the first three months, August to October, and in the last three months, May to July, the average period of detention was the same, namely, 55 days. In the November to January quarter it was 58 days, or only three days longer, and in the February to April quarter, in which it was the highest, it was 61 days.

If the figures for each hospital be examined separately it will also be observed that the average period of detention for each month varies considerably in the same hospital. Thus at the South-Eastern, the South-Western, and the Grove Hospitals, the highest and lowest average periods of detention, differed by as much as 29·4, 23·5 and 20·1 days, in the order mentioned.

IV.

In Tables 5 and 6 are given, in monthly and quarterly periods, the number of "infecting cases," and the average period of detention of the "infecting cases" and of "all cases."

TABLE 5.

Month.	No. of Patients discharged.	No. of Infecting cases.	Percentage of Infecting cases on discharges.	Average period of detention (in days) (All cases).	Average period of detention (Infecting cases).
August, 1901	565	6	1·06	53·59	42·50
September	608	9	1·48	59·63	67·11
October	717	4	·55	53·83	95·
November	639	13	2·03	54·30	59 23
December	666	5	·75	57·50	64·
January, 1902	639	8	1·25	63·28	63·50
February	473	12	2·53	64·10	81·66
March	518	6	1·15	60·12	93·33
April	529	9	1·70	59·24	56·33
May	558	9	1·61	57·86	58·22
June	444	4	·90	55·15	69·50
July	510	2	·39	52·94	64·
TOTAL	6866	87	1·26	57·55	65·47

Quarterly Return.

TABLE 6.

Period.	Discharges.	Percentage of Infecting cases on discharges.	Period of detention in days. (All cases).	Period of detention Infecting cases).
August to October, 1901. No. of cases	1890	1·0	55·63	65·21
November, 1901, *to January*, 1902. No. of cases	1944	1·33	58·35	61·46
February to April, 1902. No. of cases	1520	1·77	61·05	75·14
May to July, 1902. No. of cases	1512	·59	55·41	62·
TOTAL ...	6866	1·26	57·55	65·47

On examining Tables 5 and 6 it will be seen that although the number of "infecting cases" was fairly uniform throughout the twelve months, there was a tendency, as in the case of scarlet fever, for the number to increase during the months from November to April. Similarly it will be noticed, that the maximum number of cases, occurred in the months when the average period of detention was highest, viz., February to April. It will also be observed that in nearly every month the "infecting cases" discharged were detained for a longer period than "all cases," and that the average period of detention of the former cases was nearly eight days longer.

These figures, therefore, demonstrate that, during certain months of the year, the increased number of "infecting cases" does not correspond to a reduction in the period of detention.

In the case of scarlet fever, it has been shown that the largest number of "infecting cases" suffered from mucous discharges, and that, during the colder months, these discharges were much more frequent. By setting up a recrudescence of infection, or possibly by causing the dislodgement of any stray infection in the nasal passages, it is probable that in the case of diphtheria as well as in connection with scarlet fever, as already suggested, climatic conditions may have some influence upon the number of "return cases."

V.

In the following Tables 7 and 8, the age distribution of the "infecting cases" is compared with that of "all cases."

TABLE 7.

Age period in years.	Under 1	1-2	2-3	3-4	4-5	5-10	10-15	15-20	20-25	25 and over.
"Infecting cases" (87) ...	—	1	11	9	15	44	5	1	—	1
Percentage	—	1·14	12·61	10·34	17·24	50·57	5·74	1·14	—	1·14
Percentage ... ... ("All cases")	1·64	5·66	9·29	11·74	12·67	35·71	11·66	4·83	2·79	3·96

TABLE 8.

Age period,	0-5	5-10	10 and over.
" Infecting cases " ... (87)	36	44	7
Percentage	41·37	50·57	8·04
Percentage ... ... (" All cases ")	41·03	35·71	23·25

These tables show that at ages of from 0—5 years, the proportions of " infecting cases " and " all cases " are the same, and that, while at ages of from 5—10 years the proportion of " infecting cases " is abnormally large, at 10 years and over the proportion is equally small.

These facts, therefore, indicate that patients between the ages of 2—10 years are associated more frequently, than at any other age, with the illness of " return cases," and that after ten years the association is comparatively rare.

The age distribution of the " infecting cases " that suffered from a morbid condition of the nose is here recorded. The number of such cases is small, but so far as they go they show a striking similarity to the tables in my report on " return cases " of scarlet fever.

The figures are as follow :—

TABLE 9.

Age periods.	Under 5.	5 — 10	10 years and over.
" All cases " Percentage ...	41·	35·7	23·2
" Infecting Cases." Morbid condition of nose (27)	13	14	—
Percentage	48·1	51·8	—

In connection with scarlet fever, it has been shown (see Table 42) that the incidence of mucous discharges was greatest among patients at ages of from 5—10 years, and it was suggested that this was probably the cause of the unduly large number of " infecting cases " which occurred at this age period.

Attention was also drawn to the fact that adults, who seldom suffer from a mucous discharge after leaving hospital, on comparatively few occasions cause " return cases."

In the above table, it will be noticed that no cases of mucous discharge appear in the column headed " 10 years and over."

VI.

In Tables 10 and 11 the age distribution of the " return cases " and that of " all cases " are compared.

TABLE 10.

Age periods.	Under 1	1-2	2-3	3-4	4-5	5-10	10-15	15-20	20-25	25 and over
Return cases ... (112)	3	11	8	11	12	40	15	4	1	7
Percentage of ditto	2·67	9·82	7·14	9·82	10·71	35·71	13·39	3·57	·89	6·25
All cases* ... (15,495)	255	878	1440	1820	1965	5534	1807	749	433	614
Percentage of ditto	1·64	5·66	9·29	11·74	12·67	35·71	11·66	4·83	2·79	3·96

* The figures here represent two years' admissions to the Board's Hospitals.

TABLE 11.

Age periods.	0-5	5-10	10 and over
Return Cases ... (112)	45	40	27
Percentage of ditto...	40·17	35·71	24·10
All Cases ... ... (15,495)	6358	5534	3603
Percentage of ditto...	41·03	35·71	23·25

These tables show, that at ages of from 0—5 years, 5—10 years, and at 10 years and over, the proportions of "return cases" and "all cases" are practically the same, from which I conclude that, unlike scarlet fever "return cases" in this respect, an unduly large proportion is not attacked at one age more than at another.

All the cases over 20 years of age, were parents of the "infecting cases." Six were females, whose ages varied from 24 to 30 years, and the remaining two cases were males, aged 30 and 40 years.

Of the 87 "infecting cases," 50 were males and 37 females, which shows a preponderance of the former.

In the case of scarlet fever, the number of "infecting cases" of each sex was 346 males and 342 females.

VII.

In the following Tables 12, 13 and 14, the periods of detention of the "infecting cases" and "all cases" are compared.

TABLE 12.

	Under 2 weeks.	2-4	4-6	6-8	8-10	10-12	12-14	14-16	Over 16	Total.
"All cases"... ...	13	210	1,726	2,059	1,133	703	468	554		6,866
Percentage	·18	3·05	25·13	29·98	16·50	10·23	6·81	8·06		
"Infecting cases"(87)	—	2	13	25	12	13	11	11		87
Percentage	—	2·29	14·94	28·73	13·79	14·94	12·64	12·64		

Table showing the proportion of "infecting cases" and that of "all cases" detained under 8 weeks, from 8 to 12 weeks and for 12 weeks and over.

TABLE 13.

Period of detention.	Under 8 weeks.	8-12 weeks.	12 weeks and over
"All cases"	58·37	26·74	14·88
"Infecting cases" ...	45·97	28·73	25·28

Table showing the proportion of "infecting cases," and that of "all cases" detained under 10 weeks and over 10 weeks.

TABLE 14.

Period of detention.	Under 10 weeks.	Over 10 weeks.
"All cases"	74·87	25·12
"Infecting cases" ...	59·77	40·22

The figures in Tables 12, 13 and 14 show that over 58·3 per cent. of the diphtheria patients were discharged under 8 weeks, that 26·7 per cent. were detained from 8 to 12 weeks, and that 14·8 per cent. were discharged after a detention of 12 weeks and over.

It will be seen that of the "infecting cases" discharged at each period of detention, the proportion of "infecting cases" to "all cases" was relatively small up to 10 weeks, but after this period unduly large.

In the following Tables 15 and 16 are given the number of patients discharged at each period of detention, and the number that, subsequent to discharge, were associated with the illness of "return cases."

TABLE 15.

Period of Detention.	No. of Discharges.	No. of Infecting Cases.	Percentage.
Under 2 weeks ...	13	2	·89
2 to 4 " ...	210		
4 " 6 " ...	1726	13	·75
6 " 8 " ...	2059	25	1·21
8 " 10 " ...	1133	12	1·05
10 " 12 " ...	703	13	1·84
12 " 14 " ...	468	11	2·35
14 and over... ...	554	11	1·98
Total	6866	87	1·26

Table showing the percentage of "infecting cases" calculated on the number of patients discharged under 8 weeks, from 8 to 12 weeks, and at 12 and over.

TABLE 16.

Period of Detention.	No. of Discharges.	No. of Infecting Cases.	Percentage.
Under 8 weeks ...	4008	40	·99
8 to 12 " ...	1836	25	1·36
12 weeks and over ...	1022	22	2·15
Total	6866	87	1·26

As in the previous tables, the above show that the number of "infecting cases" discharged at a later period, caused more "return cases," than those sent out earlier.

As the severe and complicated cases are detained the longest, the inference drawn is that these are the cases most likely to cause "return cases," in spite of the longer detention.

In the following list is given the complications from which the "infecting cases" detained for a period of 12 weeks and over suffered.

Severe attack, accompanied by paralysis	6	Cases
Mucous discharges (otorrhoea and rhinorrhœa)	4	,,
Relapse of the disease	1	,,
Pneumonia	1	,,
Superadded infectious diseases	10	,,
Total	22	,,

Six of the last cases contracted scarlet fever, and one diphtheria. In addition, two patients suffered while in hospital from a slight watery running from the nose, in which diphtheria bacilli were found, and one case contracted varicella during the late stage of convalescence.

So that of the "infecting cases" discharged over twelve weeks nearly half suffered from a mixed infection.

From which it is apparent, that patients who suffer from "superadded diseases" retain infection a long time, and are prone to cause "return cases."

The following is an interesting case, bearing on this point, for the clinical notes of which I am indebted to Dr. Goodall.

Case 52.—W. R., aged 2 years, was admitted to hospital on September 18th, 1901, suffering from scarlet fever. His attack was not severe, but he suffered from rhinorrhœa and otorrhœa, the former being present on admission, and the latter appearing eight days later.

The rhinorrhœa ceased after a few days but the otorrhœa continued intermittently up to the time of discharge. On December 9th, rhinorrhœa recurred. On December 23rd, the discharge from the nose was slight and the right nostril was noted to be excoriated. With a view to discharging him in the course of a few days, on this date the patient was moved from the general scarlet fever ward to a separate room in an isolation block. On December 28th, diphtheria bacilli were found in the nasal discharge and again on January 14th, 1902. On February 5th when the last culture was made no diphtheria bacilli were found. On February 7th when the patient was discharged, he had slight rhinorrhœa and otorrhœa.

I should add that for the whole period from December 23rd until the date of discharge, the patient was in the isolation ward by himself. He had no rise of temperature and no clinical signs of diphtheria whatever. The patient returned home to a family where there were two other children, aged five and one. Sixteen days later, the elder child contracted diphtheria. Unfortunately the culture which I took of this case was damaged and no results could be obtained, but the evidence, such as it was, pointed to the discharged patient being the cause of the "return case."

Table 17 gives for each hospital the period of detention in weeks of "all cases" and Table 18 the period of detention of "infecting cases." In Table 19 the "infecting cases" and "all cases" for each hospital are compared and the percentage of "infecting cases" at each period of detention is shown.

TABLE 17.

Table showing the period of detention of "All Cases." (Period—August, 1901, to July, 1902.)

Period.	E.H.	S.E.H.	N.E.H.	W.H.	S.W.H.	N.W.H.	P.H.	B.H.	G.H.	F.H.	G.F.H.	N.H.	Total.	Percentage.
Under 2 weeks ...	...	1	1	1	...	1	2	1	6	...	...	...	13	·18
2 — 4 "	15	16	19	12	22	21	50	23	32	...	...	...	210	3·05
4 — 6 "	100	90	272	146	178	314	198	152	264	...	...	12	1726	25·13
6 — 8 "	356	152	152	257	72	208	128	204	433	...	...	97	2059	29·98
8 — 10 "	115	94	87	80	39	117	82	132	231	...	...	156	1133	16·40
10 — 12 "	81	61	49	53	33	50	55	106	141	...	...	74	703	10·23
12 — 14 "	58	46	25	45	24	35	32	49	114	...	...	40	468	6·81
14 weeks and over ...	91	58	35	44	45	31	26	49	119	...	...	56	554	8·06
Total	816	518	640	638	413	777	573	716	1340	...	...	435	6866	—

Table showing the period of detention of "infecting cases." Period, August, 1901, to July, 1902.

TABLE 18.

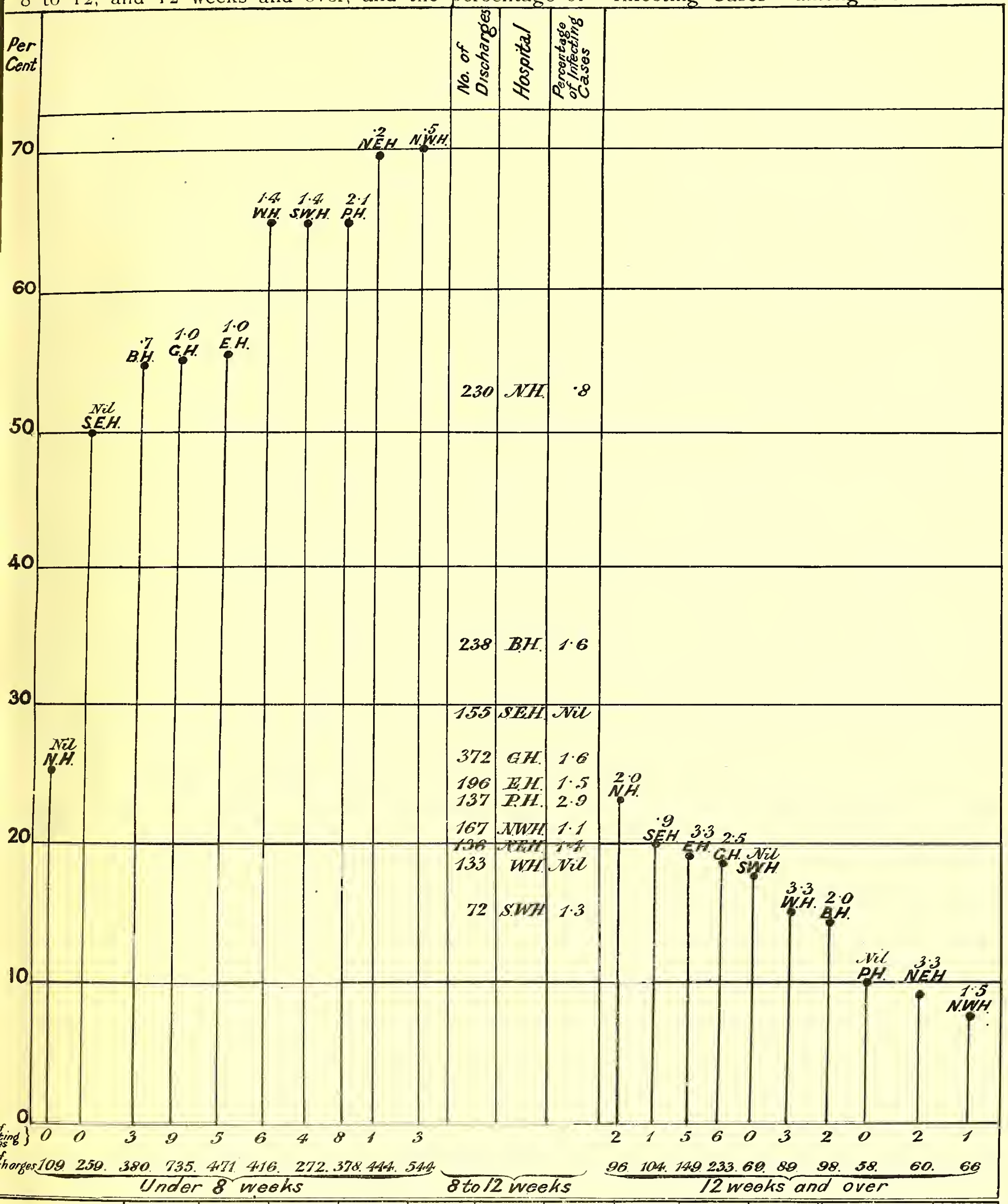
Period.	E.H.	S.E.H.	N.E.H.	W.H.	S.W.H.	N.W.H.	P.H.	B.H.	G.H.	F.H.	G.F.H.	N.H.	Total.	Percentage of Infecting Cases.
2 to 4 weeks ...	...	...	...	...	...	...	...	2	...	...	...	...	2	2·29
4 „ 6 „ ...	1	...	...	...	3	2	5	...	2	...	...	...	13	14·9
6 „ 8 „ ...	4	...	1	6	1	1	3	1	7	1	...	...	25	28·73
8 „ 10 „ ...	2	...	1	...	...	1	2	1	4	...	...	1	12	13·79
10 „ 12 „ ...	1	...	1	...	1	1	2	3	2	1	...	1	13	14·91
12 „ 14 „ ...	1	...	1	2	...	1	...	1	4	...	...	1	11	12·64
14 weeks and over ...	4	1	1	1	...	...	...	1	2	...	...	1	11	12·64
Total ...	13	1	5	9	5	6	12	9	21	2	...	4	87	...

TABLE 19.

Table showing the period of detention of "infecting cases" as compared with "all cases," together with the percentage of "infecting cases" calculated on the number of discharges at each period.— See accompanying Chart IX.

Period.	E.H.	S.E.H.	N.E.H.	W.H.	S.W.H.	N.W.H.	P.H.	B.H.	G.H.	F.H.	G.F.H.	N. H.	Total.
Under 8 Weeks—													
"All cases"...	471	259	444	416	272	544	378	380	735	—	—	109	4008
Percentage of ditto	57·72	50·0	69·37	65·20	65·35	70·01	65·96	53·07	54·85	—	—	25·05	58·37
"Infecting cases"	5	—	1	6	4	3	8	3	9	1	—	—	40
Percentage of ditto	38·46	—	20·0	66·66	80·0	50·0	66·66	33·33	42·85	50·0	—	—	45·97
Percentage of infecting cases on Discharges	1·0	—	·22	1·44	1·47	·55	2·1	·78	1·08	—	—	—	·99
8 *to* 12 *Weeks*—													
"All cases"...	196	155	136	133	72	167	137	238	372	—	—	230	1836
Percentage of ditto	24·01	29·92	21·25	20·84	17·43	21·49	23·90	33·24	27·76	—	—	52·87	26·74
"Infecting cases"	3	—	2	—	1	2	4	4	6	1	—	2	25
Percentage of ditto	23·07	—	40·0	—	20·0	33·33	33·33	44·44	28·57	50·0	—	50·0	28·73
Percentage of infecting cases on Discharges	1·5	—	1·47	—	1·38	1·19	2·91	1·68	1·61	—	—	·86	1·36
12 *Weeks and Over*—													
"All cases"...	149	104	60	89	69	66	58	98	233	—	—	96	1022
Percentage of ditto	18·25	20·07	9·37	13·94	16·70	8·49	10·12	13·68	17·38	—	—	22·06	14·88
"Infecting cases"	5	1	2	3	—	1	—	2	6	—	—	2	22
Percentage of ditto	38·46	100·0	40·0	33·33	—	16·66	—	22·22	28·57	—	—	50·0	24·70
Percentage of infecting cases on Discharges...	3·35	·96	3·33	3·37	—	1·51	—	2·04	2·57	—	—	2·08	2·15
Percentage on Total Discharges ...	1·5	·19	·7	1·4	1·2	·7	2·09	1·2	1·5	—	—	·9	1·26
Average period of detention "All cases"	60·51	62·29	51·35	56·37	55·10	50·21	51·23	58·64	60·29	—	—	71·01	57·55

HART IX. Showing for each Hospital the proportion of Diphtheria Patients discharged under 8 weeks, 8 to 12, and 12 weeks and over, and the percentage of "Infecting Cases" among ~~the same.~~ them.



No. of Discharges	Hospital	Percentage of Infecting Cases
230	N.H.	·8
238	B.H.	1·6
155	S.E.H.	Nil
372	G.H.	1·6
196	E.H.	1·5
137	P.H.	2·9
167	N.W.H.	1·1
136	N.E.H.	1·4
133	W.H.	Nil
72	S.W.H.	1·3

	S.E.H.	N.W.H.	N.E.H.	N.H.	B.H.	S.W.H.	W.H.	G.H.	E.H.	P.H.	Total	
al Discharges	518	777	640	435	716	413	638	1340	816	573	6866	
f "Infecting Cases"	1	6	5	4	9	5	9	21	13	12	87*	
centage of ecting Cases"	·1	·7	·7	·9	1·2	1·2	1·4	1·5	1·5	2·0	1·2	
erage period detention. All Cases")	62·2	50·2	51·3	71·	58·6	55·1	56·3	60·2	60·5	51·2	57·5	

* Two cases from the Fountain Hospital have been omitted.

Before proceeding further I should state that for comparative purposes, the number of cases dealt with here is far too small. For instance, at only three hospitals did the number of "infecting cases" reach double figures, and as one or two extra cases may make a great difference in the relative positions of the hospitals, it is quite possible that those which now have a higher percentage of "infecting cases" might appear in a more favourable light if the number of cases investigated had been larger.

This reservation should be borne in mind when examining the figures in these tables, which in conjunction with the accompanying Chart IX., show that of the Acute Hospitals, the South-Eastern discharged 50 per cent., and the Grove, Brook, and Eastern Hospitals discharged from 50 to 60 per cent. of their cases under 8 weeks; within a like period, the Western, South-Western and Park Hospitals 67 per cent. of their cases, and the North-Eastern and North-Western Hospitals 70 per cent.

The Northern Convalescent Hospital discharged from 20 to 30 per cent.

Among the patients discharged during this period the N. & S.E. Hospitals had no alleged "infecting cases": the N.E., N.W., and Brook Hospitals ·2, ·5 and ·7 per cent., respectively: the remaining Hospitals from 1 to 2·1 per cent.

In the 8 to 12 weeks period the S.E. and W. Hospitals had no "infecting cases," the S.W. about the same number as amongst the patients discharged under 8 weeks, and the remaining seven hospitals had a higher percentage than in the first-named period.

Among the patients discharged after a detention of 12 weeks and over, the Park and S.W. Hospitals had no "infecting cases," but each of the remaining hospitals had its highest percentage of cases at this period.

On referring again to the chart it will also be seen that the S.E., N.W., N.E., and N. Hospitals had in the order mentioned, ·1, ·7, ·7 and ·9 per cent. of "infecting cases," on the total number discharged; the remaining hospitals from 1·2 to 2 per cent. And, further it will be observed, that the best results corresponded to the shortest and longest average periods of detention, from which circumstance I conclude that long detention is not the cause of "return cases," as the figures in the previous Tables 15 and 16 if considered alone might possibly suggest.

At the South-Eastern, North-Western, Brook, and Grove Hospitals a bacteriological examination is made prior to discharge of all diphtheria patients. At the North-Eastern, South-Western, and Western Hospitals, only in those cases in which the state of the patient was abnormal at the time of discharge, as, for instance, when a morbid condition of the mucous membrane of throat or nose existed. At the Northern and Eastern Hospitals until recently, it has not been the regular practice to make such an examination, and at the Park Hospital no bacteriological examination is made, except in cases of certified diphtheria, when the diagnosis is not clinically confirmed.

With regard to the bacteriological test. At the hospitals where this is the routine practice, as a rule but one culture is taken from the throat and should this prove negative the patient is discharged. The nose is not usually examined except when there is some special indication to prompt such a course being taken. Only on rare occasions are patients discharged who have diphtheria bacilli still present, and these are generally cases that have been in hospital for a period of three months and over.

So far as these figures show, the hospitals which apply the bacteriological test only, to cases with a morbid condition of the mucous membrane, apparently obtain as good results as those hospitals which use it as a matter of routine in all cases, from which it would appear that nothing is to be gained by extending the examination to the uncomplicated cases.

At the same time an apparently normal condition of the mucous membrane does not exclude the possibility of diphtheria bacilli being present.

In not a few of the "infecting cases" diphtheria bacilli were present, although there was no reason to suspect the mucous membrane.

As an instance of this the following case is perhaps one of the most interesting:

Case 76.—J. J., aged 3 years, was admitted to hospital on the 31st December, 1901, and discharged on the 9th March, 1902. Fourteen days later, March 23rd, his sister, L. J., was admitted to hospital suffering from diphtheria; she had a mild attack and on April 29th was discharged after a detention of 37 days. On June 20th, 88 days later, her sister M. J., aged 15 years, was admitted to hospital, suffering from diphtheria. On March 27th, the occasion of my first visit, and again on July 1st, swabs were taken from the throat of the original case J. J., and on each occasion diphtheria bacilli were found in large numbers. On the latter date L. J. also was examined, a nearly pure culture of diphtheria bacilli being obtained from her throat. Unless J.J. was re-infected after he returned home, the bacilli must have been present in his throat for at least six months.

The house in which the first two "return cases" were taken ill was exceedingly damp and dark and the living room occupied by the family was most unwholesome. However, shortly after the second case L. J. was discharged from hospital, her parents moved to a more desirable house, and it was here the last "return case" was taken ill. A point of interest in this case is the length of the "interval," namely, 88 days. This is accounted for by the fact that M. J., who was an under-nurse in a house where there were several children, did not live at home until five days before the commencement of her illness. From the evidence obtained, I have very little doubt that she was infected after her return home.

At the Western and South-Western Hospitals, where only abnormal or special cases are examined, six out of nine in the former, and four out of five in the latter hospital, were patients discharged under eight weeks. As nearly half of the "infecting cases" were discharged at this period and since the majority of them were probably normal cases, the question arises whether the bacteriological test should not be applied to all cases. In the same way it appears just possible that if the cases with a mucous discharge or morbid condition of the throat were examined a second time, in the event of the first culture proving negative, the number of "infecting cases" at present small, might be still reduced further. This would apply more especially to cases of mixed infection.

VIII.

In the following Table 20 is separately given the condition present on discharge of (*a*) the "infecting cases" that suffered from diphtheria only, and (*b*) those that suffered from diphtheria and scarlet fever.

(*a*) *Diphtheria subsequent to return of diphtheria.* Condition of "all cases" on discharge and of "infecting cases" after discharge.

TABLE 20.

No. of Cases.	Rhinorrhœa	Rhinitis	Nasal Catarrh	Morbid Throat	Enlarged Glands	Otorrhœa	Affections of Skin and Scalp	No Morbid condition	D.B. present
"All Cases" ... (6866)	51	23	—	607	175	5	58	5875	—
Percentage ...	·7	·3	—	8·8	2·5	·07	·84	85·5	—
		1·							
"Infecting Cases" (71)*	4	10	5	4	4	2	2	45	18
Percentage ...	5·6	14·	7·	5·6	5·6	2·8	2·8	63·3	25·3
		26·6							

* Two cases are omitted from this table for although the "infecting case" suffered from diphtheria alone, the "return cases" were cases of both diphtheria and scarlet fever.

(*b*) *Diphtheria subsequent to return of Diphtheria and Scarlet Fever.* Condition of patients after discharge.

"Infecting Cases" (14)	3	3	2	1	—	—	1	7	5
Percentage ...	21·4	21·4	14·2	7·1	—	—	7·1	50·0	35·7
		57·0							

In the above table it will be seen that in each group of "infecting cases" a morbid condition of the nose was the affection most frequently present. It will also be noticed that the number of cases which suffered from a morbid condition of the throat was not excessive.

A bacteriological examination was made of nearly all the "infecting cases" and in many, a swab was taken of both the throat and nose, but a negative result was not infrequent, even in those cases in which there could be very little doubt but that the discharged patient was the cause of the fresh outbreak. This was probably due to the fact that it was the exception for more than one examination to be made of the patient. Of the two groups the bacilli were found most frequently in the cases that suffered from a mixed infection, and it is also interesting to note that in this group a morbid condition of the nose was more than twice as frequently present as in the other.

These facts appear to point to a causal relationship, as has been shown to exist in the case of scarlet fever, between a morbid condition of the nose and "return cases" of diphtheria.

IX.

Diphtheria subsequent to the discharge of Scarlet Fever patients.—In Table 21, is given for each hospital the period of detention of 55 cases of scarlet fever, which subsequent to discharge were associated with the illness of "return cases" of diphtheria. In none of the "infecting cases" was there any clinical evidence of diphtheria.

Diphtheria, subsequent to return of scarlet fever.—Table showing the period of detention of "infecting cases." (Period—August, 1901, to July, 1902.)

TABLE 21.

Period.	E.H.	S.E.H.	N.E.H.	W.H.	S.W.H.	N.W.H	P.H.	B.H.	G.H.	F.H.	G.F.H.	N.H.	TOTAL.		
													Scarlet Fever Discharges.	Infecting Cases.	Percentage on Discharges.
Scarlet Fever Discharges.	110	481	1478	923	875	921	2215	1647	47	2121	523	4160			
Under 6 weeks.							5						1078	5	·46
6 to 8 ,,		1				1	3	5				3	5070	13	·25
8 ,, 10 ,,				2		1	4	1		7	1	5	4667	21	·44
10 ,, 12 ,,				1	1	1	1	3		1		2	2258	10	·44
12 ,, 14 ,,	1									1		2	1222	4	·32
14 weeks and over ...					1					1			1206	2	·16
TOTAL	1	1		3	2	3	13	9		10	1	12	15,501	55	·35

In Table 22 the number of scarlet fever patients discharged under 8 weeks, from 8 to 12 weeks, and at a period of 12 weeks and over are given, together with the number of such cases that were subsequently alleged to be the cause of "return cases" of diphtheria.

TABLE 22.

Diphtheria, subsequent to return of scarlet fever.

Period.	No. of discharges.	No. of infecting cases.	Percentage.
Under 8 weeks ...	6,148	18	·29
8 to 12 weeks ...	6.925	31	·44
12 weeks and over ...	2,428	6	·24
Total	15,501	55	·35

An examination of this table shows that, as in the case of scarlet fever, the largest number of "infecting cases" occurred among patients discharged between eight and twelve weeks. Before and after this period the proportion of "infecting cases" was about the same.

In Table 23 the "interval" is given.

Diphtheria subsequent to return of scarlet fever.—Table showing the "interval" between the discharge of the "infecting cases" and the onset of illness of the first "return case."

TABLE 23.

	Under 1 week.	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12	Total.
No. of Cases (55) ...	19	14	15	5	1		—	—	—	—	—	—	55
Percentage of ditto ...	34·54	25·45	27·27	9·09	1·81	1·81	—	—	—	—	—	—	—

On contrasting this table with Table 2 it will be noticed that, in each case, over 59 per cent. were attacked in the first fortnight.

Diphtheria, subsequent to return of scarlet fever. } Table showing the condition of "infecting cases" present after discharge.

TABLE 24.

No. of Cases.	Morbid condition of nose.			Morbid condition of Throat.	Enlarged Glands.	Desquamation.	Affections of Skin and Scalp.	Otorrhœa.	Post Pharyngeal Catarrh.	Cough.	D.B. present.	No apparent Morbid Condition.
	Rhinorrhœa.	Rhinitis.	Nasal Catarrh or Non-Purulent Rhinorrhœa.									
Infecting cases (55).	9	15	5	9	2	3	1	1	1	...	16	15
Percentage.	16·36	27·27	9·09	16·3	3·6	5·4	1·8	1·8	1·8	...	29·	27·2
		52·7										

In the above table appears a statement of the condition present after discharge of these alleged "infecting cases," which shows that a morbid condition of the nose was most frequently present, and that 52·7 per cent. suffered from this affection. In addition, after discharge 29 per cent. of the cases had evidence of diphtheria bacilli either in the nose or throat.

In a little more than a third of the cases, the discharged patient appeared to be the cause of the "return case." The figures are as follow:—

Table 25.

Classification.	A.	B.	C.
No. of Cases (55) ...	19	18	18
Percentages	34·5	32·7	32·7

In addition to the above cases, there were eight fresh outbreaks which occurred after the discharge of scarlet fever patients which have been included under scarlet fever "return cases." In five of these outbreaks, one or more of the "return cases" contracted diphtheria, while others suffered from scarlet fever. In the three other houses, one or more of the "return cases" suffered from both diphtheria and scarlet fever, and the remaining cases from either diphtheria or scarlet fever alone.

In the following case one of the "return cases" suffered from scarlet fever and diphtheria, one from scarlet fever alone, and two from diphtheria.

Case 79.—M. B., aged 5 years, was discharged from hospital on September 6th, 1901, after a detention of 99 days. While in hospital he suffered from double otorrhœa which was also present on discharge. He was apparently quite well until two days after he returned, when a thick nasal discharge commenced. On September 9th ("interval" three days), his sister M. B., aged 4, failed with diphtheria. Three days later R. B., aged 12, was taken ill with scarlet fever and diphtheria, and on the next day his brother R. B., aged 14, was certified scarlet fever. On September 20th after a further interval of seven days P. B., aged 8, was taken ill with diphtheria. A point of interest in connection with this case is that the only two children that escaped infection suffered from "mumps," shortly before the alleged "infecting case" M. B. was taken to hospital.

In the next case the first two "return cases" suffered from scarlet fever and diphtheria; and the last two from scarlet fever only.

Case 73.—E. W., aged 6 years, was discharged from hospital on August 9th, 1901, after a detention of 73 days. He had cervical abscess and otorrhœa while in hospital. When he left hospital his neck was stated to be swollen. After an "interval" of six and seven days W. S., aged 5, and H. W., aged 2, failed with scarlet fever and diphtheria. Four days later A. S., aged 6, failed with scarlet fever, and on September 3rd, that is, after a further "interval" of 14 days, C. W., aged 7, was also taken ill with scarlet fever.

N.B.—The two families "S" and "W" are related and live in the same house.

Case 549.—In this case, three of the "return cases" who were children contracted scarlet fever, and one adult, the mother of these patients, diphtheria.

The alleged "infecting case" was discharged on April 15th, 1902. Five days later, an infant, aged 9 months, had a rash and a thick nasal discharge. The illness was diagnosed "measles."

On April 27th, T. W., aged 5 years, failed with scarlet fever. The next day E. W., aged 30, failed with diphtheria, while on the same day A. C., aged 14, who lived in the same house also failed with scarlet fever. Three days later E. W., aged 3 years, was taken ill with the same disease.

In 28 of the houses to which the 55 "infecting cases" were discharged, one of the "return cases" was notified, on or after admission to hospital to be dangerously ill, and of these nine died. The number infected was 69.

Taken by themselves, 55 cases out of 15,501 scarlet fever discharges may not be looked upon as a large proportion, but since they form an important addition to the already large number of "superadded diseases," their reduction becomes a question for consideration.

As a preventive measure, a bacteriological examination of all patients before discharge might be suggested, but it is, I think, very doubtful whether the results would commensurate with the large amount of additional labour entailed by such a procedure.

In my opinion, the only practical solution of the difficulty is to carry out the suggested measures for the prevention of "return cases" of scarlet fever,—in other words to isolate separately for a probationary period, all patients immediately they are admitted to hospital, with a view to further classification.

Should any patient be then incubating an infectious disease or should diphtheria bacilli be found during the probationary period, its spread to others could be effectually prevented. The adoption of such a course would have the additional advantage of reducing the period of detention, for not only are many patients infected during convalescence, but the discovery of the diphtheria bacilli early—instead of, as is usually the case, in the late stage of the disease, when perhaps the persistence of a chronic discharge, or an outbreak of post scarlatinal diphtheria, arouses suspicion—would place the patient under treatment from the commencement, instead of at a time when so far as the infection from scarlet fever is concerned he might be fit for discharge.

At the Pasteur Hospital from October 1st, 1900, to April 19th, 1903, the diseases treated were as follow:—Diphtheria, 443; non-diphtherial anginas, 166; smallpox, 524; chickenpox, 55; measles, 126; scarlet fever, 92; erysipelas, 163; abscess of the tonsil, 20; hydrophobia, 7; antirabic treatment, 26; preventive treatments for diphtheria, 7; mothers of sick children or children of sick mothers, 194; cases which do not come under the above heads, 179; making a total of 2,000 cases. Since the latter date, 745 more patients were admitted, making a total of 2,745. Out of this number there have only been 8 cases of contagion, viz., 5 of smallpox, 2 of erysipelas, and 1 of diphtheria. (Extract from "British Medical Journal," April 9th, 1904.)

CONCLUSIONS TO PART II.

The following is a summary of the results of my investigations into "return cases" of diphtheria and the conclusions at which I have arrived.

(1) That, subsequent to the discharge from the Board's hospitals of 6,866 recovered diphtheria patients and 15,601 scarlet fever patients, there were 142 separate outbreaks of diphtheria, of which 87 of the "infecting cases" suffered from diphtheria, and 55 from scarlet fever.

(2) That the 87 "infecting cases" are equivalent to 1·2 per cent., calculated on the total diphtheria discharges, and the remaining 55 cases to ·35 per cent. on the scarlet fever discharges.

(3) That, of the 142 "infecting cases," 30·2 per cent. appeared to be the cause of the "return cases." That in 33 per cent. there was reason to believe that the "return cases" were infected from some other source. That in 36·6 per cent. the evidence was of doubtful nature and it was impossible to exclude the discharged patients as the cause of the "return cases."

(4) That, within an "interval" of one week after the discharge of the "infecting cases," nearly one-third of the "return cases" were attacked—29·8 to 31·6 per cent. Within an "interval" of a fortnight about 59 per cent. Within an "interval" of a month from 96·3 to 88·5 per cent. After an "interval" of six weeks there were two cases one in the eighth and one in the thirteenth week.

(5) That "return cases" occurred in all months of the year, but more especially during the months from November to April.

(6) That the increase during these months was not brought about by a reduction in the period of detention.

(7) That the average period of detention of the "infecting cases" was 65·4 days, or nearly eight days longer than "all cases."

(8) That a morbid condition of the nose was present in 26·6 per cent. of the "infecting cases" that suffered from diphtheria, and in 52·7 per cent. of the cases that suffered from scarlet fever.

(9) That between the ages of from 5—10 years the discharged patients are more frequently associated with the illness of "return cases," than at any other age period, and that after ten years the association is comparatively rare.

(10) That between the ages of from 5—10 years the incidence of mucous discharge is greatest, while after this age it seldom occurs.

(11) That the patients discharged after a detention of 8—12 weeks cause a relatively larger number of "return cases," than those discharged under 8 weeks, and those discharged after a detention of 12 weeks and over more than those at any other period.

(12) That the hospitals which had the highest and lowest average period of detention had also the least number of "infecting cases."

(13) That the bacteriological examination of both throat and nose of all cases of diphtheria prior to discharge, and the separate isolation for a probationary period of all cases of scarlet fever, immediately they are admitted to hospital, with a view to classifying them later, would tend to reduce the number of "return cases" of diphtheria.

In conclusion, I have to thank the Medical Officers of Health and the Medical Officer of the School Board for London, who have rendered me every assistance, for their kind co-operation, and the former for the valuable tables with which they were good enough to furnish me.

I also desire to thank Dr. Matthews, Medical Superintendent of the Fountain Hospital, who examined in their homes the 500 discharged patients referred to in this report.

To Dr. E. C. Willcox, Senior Assistant Medical Officer at the Western Hospital, I am also much indebted for the examination of several hundred swabs, as I found it quite impossible alone to carry on satisfactorily the bacteriological work which this investigation entailed.

Several of the hospitals supplied me regularly with statistical and other information, which gave a good deal of additional labour to the Assistant Medical Officers. I am most grateful to them and to the Medical Superintendents, whose kind assistance has facilitated my enquiry and contributed to the pleasure of this most interesting work.

To the Special and Medical Sub-Committee I have to acknowledge with gratitude the kindness which they have shown me, and the patience with which they have awaited my report.

In submitting the results of my investigations to your consideration, I am conscious of many points in connection with this subject which require still further elucidation. While I myself, have been led to the convictions to which I have given expression, by the general indications of the evidence obtained, all, in my opinion, pointing in the same direction—I can hardly expect that the conclusions at which I have arrived will meet with universal acceptance. However, I venture, at least, to hope, that the facts brought to light will contribute towards the ultimate solution of a complicated problem, and enable others who have worked at the subject to compare their results with mine.

(Signed) A. G. R. CAMERON,
Medical Investigator for the Board.

6, Crown Office Row,
Temple, E.C.
March, 1904.

APPENDIX.

I.

Scarlatina Sine Eruptione.

History of illness of Infecting Case. Sore throat before the illness of Infecting Case.

No. of Case.	Infecting Case. Name and Age.	Date of Discharge.	Classification.	Return Case.	Interval (in days)
				Name, Age and Onset of illness.	
92	S. B. Age 17	4th Sept., 1901	A	G. B. Age 3 Onset 29th September, '01	25
120	M. C. Age 5	2nd October, '01	C	S. D. Age 2 Onset 11th October, '01	9
347	J. F. Age 4	31st Dec., 1901	C	T. F. Age 13 Onset 20th January, '02	20
450	L. M. Age 6	11th March, '02	C	C. M. Age 2½ Onset 16th March, '02	5
596	H. A. Age $2^{11}/_{12}$	10th July, 1902	C	M. A. Age $2^{11}/_{12}$ Onset 18th July, '02	8
607	G. C. Age 3	17th June, 1902	B	F. C. Age 2 Onset 19th July, '02	32
294	A. S. Age 5	3rd January, '02	A	W. S. Age 2 Onset 6th January, '02	3

History of illness of Return Case. Sore throat before discharge of Infecting Case.

96	W. H. Age 1½	18th Sept., 1901	B	Mrs. H. Age 39 Onset 22nd September D. H. Age 5 Onset 25th September	4 7
65	G. F. Age 13	30th August, '01	B	F. F. Age 5 Onset 29th August	—1
72	J. C. Age 7	4th Sept., 1901	B	R. C. Age 5½ Onset 8th September	4
111	A. M. Age $5^{10}/_{12}$	25th Sept., 1901	C	J. M. Age 2 Onset 30th September N. M. Age 4 Onset 8th October	5 13

Mrs. B had a severe sore throat immediately before her son—"infecting case"—was taken ill. The latter was discharged on September 4th. On 12th September his father had a severe sore throat, high temperature and delirium. Seventeen days later (29th September) return case was taken ill.

Two days before infecting case was taken ill, E. C., aged 9, had severe sore throat, headache, and swollen glands and was in bed 3 days. The day after infecting case was taken ill, F. C., aged 2, had sore throat and diarrhœa and similarly the mother of these children suffered from sore throat, five days after the illness of the return case. She was in bed six days.

Three or four days before infecting case was taken ill, L. F., aged 7, had a sore throat. And at the same time infecting case was taken ill his mother was in bed with a severe sore throat.

On 1st January, Mr. M. had sore throat, headache, pains all over, malaise, swollen glands, furred tongue. Was examined by two doctors in consultation who had suspicions of scarlet fever Seven days later, 8th January, infecting case was taken ill.

On 16th May, Mrs. A. had severe sore throat, headache, shivering, nausea, and "could not stand.". On 17th May, infecting case was taken ill, and, on 18th May, was certified to be suffering from scarlet fever and admitted to hospital.

On 27th April, Mrs. C. had a severe sore throat and swollen neck and was ill for a week. Believes she contracted it at out-patients' department of a general hospital. On 3rd May, G. C., aged 3, was taken ill, certified scarlet fever and admitted to hospital.

Mother had sore throat before infecting case was taken ill.

E. M., aged 20, who lives in same house and is sister to Mrs. H., was taken ill September 16th with sore throat. On September 17th, temperature 102. Backache and headache, shivering, "hot at times," general pains. Was ill a week or ten days. Six days later, September 22nd, Mrs. H. was taken ill with scarlet fever.

August 16th, Mrs. F. had severe sore throat which "left her very weak" (ill about 3 weeks). On August 19th, F. F. (return case) had sore throat and was in bed a few days; on August 29th his sore throat returned and other symptoms of scarlet fever set in. On August 30th scarlet fever rash appeared in the early morning. *The alleged infecting case was discharged the same afternoon.*

On September 3rd, Mrs. C. had headache and sneezing. Thought she had caught cold. September 6th had a very painful sore throat; September 8th and 9th had vomiting, throat still very painful, she was in bed from 6th to 9th. Convalescence was slow. Felt very fatigued when she got up. September 12th, throat injected. Tongue—papillæ prominent. No desquamation.

Mrs. M. had "very bad sore throat" shortly before infecting case came home. "Could hardly get about." Swallowed with much difficulty. Tongue was white, became afterwards "red in patches" and was tender, the papillæ were prominent. The throat was not well for a fortnight.

No. of Case.	Infecting Case. Name and Age.	Date of Discharge.	Classification.	Return Case.	Interval (in days)
				Name, Age and Onset of illness.	
156	A. G. Age 7	25th October, '01	C	L. G. Age 9 Onset 3rd November A. G. Age 13 Onset 9th November	9 15
240	L. B. Age 3½	23rd Dec., 1901	B	A. B. Age 6 Onset 28th December	5
253	H. H. Age 12	18th Nov., 1901	B	C. T. Age $^{11}/_{12}$ Onset 6th December (Died)	18
327	D. N. Age 5	11th Jan., 1902	C	M. N. Age 2 Onset 14th January	3
336	D. H. Age 11	24th Dec., 1902	B	J. H. Age 6 Onset 3rd January	10
364	D. H. Age 15	29th Jan., 1902	C	N. H. Age 4 Onset 8th February	10
507	G. G. Age 9	12th April, 1902	C	M. G. Age 11 Onset 14th April	2
510	P. H. Age 6	23rd April, 1902	C	F. H. Age 3 Onset 27th April	4
577	E. W. Age 9	26th May, 1902	B	M. W. Age 8 Onset 19th June L. W. Age 14 Onset 14th June	24
537	E. W. Age 11	15th May, 1902	B	H.W. Age 15 Onset 19th May	4

History of illness of Return Case. Sore throat after discharge of Infecting Case and before the illness of Return Case.

71	S. H. Age 5	5th Sept., 1901	C	E. H. Age 8 Onset 9th September.	4
66	E. A. Age 13	28th Aug., 1901	C	G. A. Age 15 Onset 4th September.	7

Primary case was in hospital 39 days. During his absence his brother G— had "symptoms of scarlet fever." He was the only susceptible one who escaped the disease after infecting case was discharged. On 2nd November, Mrs. G. had severe sore throat "quinsy." On the following day return case was taken ill.

On December 23rd, Mrs. B had a sore throat, which reached a crisis on the 26th. She was ill for a week or 10 days. Her throat was sore the day infecting case came home.

W. H. (15) was taken ill soon after infecting case was admitted to hospital. Diagnosed tonsillitis. T. H., aged 9, was taken ill soon after W. H. Diagnosed influenza and tonsillitis. F. H., aged 11, was taken ill a week before infecting case was discharged. Diagnosed tonsillitis. December 4th, Mrs. T. had sore throat, etc. Two days later return case was taken ill with scarlet fever. The "T" and "H" families live in the same house. Mrs. T. had only one child—the return case.

January 1st, Mrs. N. had a "severe ulcerated throat," was ill for a week.

Mrs. H. had a severe sore throat and was three weeks in bed. On December 24th she got up feeling very weak.

On January 29th, the day the infecting case was discharged, his mother had a sore throat.

On February 28th, Mrs. G. was laid up in bed with "influenza." This was the only case of influenza in the house.

F.H. had a sore throat for a fortnight before she was taken ill with scarlet fever and was treated for "tonsillitis." Her mother had a sore throat at the same time.

On May 5th, L.W., aged 14, had "ulcerated sore throat" and was laid up until 12th. On June 14th sore throat again and on June 22nd rash of scarlet fever.

On April 26th, return case had headache, sore throat, enlarged glands, and was feverish. Tongue "creamy afterwards cracked." Became very weak and lost flesh. He had ? relapse on 19th May.

On September 6th, Mrs. H. had a severe sore throat, tongue furred, shivering, feverish, headache, backache, anorexia, nausea. September 8th tongue clean. Mrs. H. had a friend staying in her house who suffered from sore throat on the 9th and 10th. *Disinfection.*—Best clothes worn day of illness of infecting case fumigated.

On September 3rd, Mrs. A. had sore throat. One of her pupils had an unrecognised attack of scarlet fever. Return case used the same towel as her mother. *Disinfection.*—Dress of infecting case not disinfected.

No. of Case.	Infecting Case. Name and Age.	Date of Discharge.	Classification.	Return Case. Name, Age and Onset of illness.	Interval (in days)
367	L. C. Age 5	18th Jan., 1902	C	F. M. Age 2 Onset 9th February	22
377	F. C. Age 9	29th Jan., 1902	A	G. C. Age 15 Onset 10th February	12
415	R. B. Age 5	10th Dec., 1901	A	W. B. Age $\frac{13}{12}$ Onset 27th December	17
524	J. H. Age 18 E. H. Age 9	19th April, 1902	C	D. H. Age 17 Onset 7th May	18
54	J. G. Age 9	24th Oct., 1901	A	M. G. Age 17 Onset 31st October	7

Sore throat after discharge of Infecting Case and at the same time as illness of Return Case.

7	G. B. Age 3	18th Dec., 1901	A	E. B. Age 5 Onset 23rd Dec.	5
289	C. C. Age 10	21st Dec., 1901	A	L. C. Age $1\frac{10}{12}$ Onset 26th Dec. Mrs. C. Age 32 Onset 29th Dec.	5 8
288	F. J. Age $1\frac{5}{12}$	23rd Dec., 1901	C	E. J. Age 4 Onset 5th January	13
547	V. F. Age 3	12th March, '02	C	F. F. Age 13 Onset 22nd March	10
62	A. H. Age 9	22nd Aug., '01.	B	F. H. Age 8 Onset 28th August	6
28	L. M. Age 5	27th July, '01	A	E.M. Age 26 Onset midnight 28th—29th July. Rash, 29th July	2

On February 5th, Mrs. M. had sore throat. The infecting case lives in the same house but is not a member of the same family as return case.

On February 8th, Mrs. C. had headache, severe vomiting, diarrhœa, pains all over and sore throat. February 15th, still in bed. Throat very painful, superficial ulceration in patches. The soft and hard palate completely covered with stomatitis. Culture taken, cocci and torulæ.

On December 22nd, A., aged 4 had "quinsy." December 26th, Mrs. B. had sore throat and the doctor said she had all the symptoms of scarlet fever without rash. *Disinfection.*—Clothes fumigated.

On May 4th, M., aged 12, had sore throat, &c. May 6th, A., aged 19, had sore throat, &c. May 6th, X., aged 20, had sore throat and remained at home a week. May 7th, Mrs. H., aged 50, had sore throat, &c. *Disinfection.*—Done at home.

On October 26th, H.G., aged 22, sister to return case, was laid up in bed with sore throat.

On 23rd December, Mr. B., aged 41, was certified to be suffering from diphtheria, and on 24th December, H., aged 12, was certified to be suffering from same complaint; both were diagnosed in hospital "tonsillitis." *Disinfection.*—No bedding or clothes disinfected.

On 29th December, Mr. C. was taken ill same time as his wife—Return case No. 2. Had very sore throat. He was in bed for a week. His doctor visited him twice daily, as he suspected scarlet fever but no rash or desquamation was observed. Mr. C.'s sister, who also visited the house, contracted a sore throat and was in bed a week.

On 6th January, M. J., aged 15, had severe headache, sore throat, enlarged glands, tongue furred and was feverish for two or three days. No rash. On 7th January, M. J., aged 10, had sore throat also, but no rash.

On 22nd March, D. F., aged 8, had sore throat, headache, vomiting. Certified diphtheria, diagnosed in hospital "tonsillitis." N.B.—D. F. had scarlet fever two years previously.

Infecting case A. H., was taken ill 1st July. Three days later G. H., aged 12, was taken ill. His symptoms were: headache, sore throat, shivering, nausea, "very hot at night." Symptoms lasted 3 days. Doctor diagnosed the case "septic sore throat."
W. H., aged 13, Onset 28th August. Sore throat, shivering, &c. No rash.

Mrs. M., aged 25. Onset of illness 5 a.m., 29th July, had exactly same symptoms as her husband—return case (E. M.)—but no rash. Was in bed several days, and felt very weak after getting up. August 3rd, tongue furred, papillæ prominent, throat very injected. No desquamation.

No. of Case.	Infecting Case. Name and Age.	Date of Discharge.	Classification.	Return Case. Name, Age and Onset of illness.	Interval (in days)
158	P. R. Age 3	18th October, '01	A	E. R. Age 6 Onset 29th October	11
				L. R. Age 17 Onset 30th October	12
				F. R. Age 2 Onset 1st November	14
172	H. K. Age 6	1st November'01	C	D. K. Age 10 Onset 19th November	18
218	C. T. Age 4	27th Nov., 1901	A	L. R. Age 4 Onset 1st December	4
264	F. G. Age 6	12th Dec., 1901	A	L. G. Age 6 Onset 23rd December	11
469	D. E. Age 7	20th March, 1902	A	R. E. Age 10 Onset 25th March	5
				C. E. Age 16 Onset 27th March	7
				F. E. Age 17 Onset 9th April	20
471	F. O. Age 4	12th March, 1902	C	W. O. Age 5 Onset 28th March	16
18	E. B. Age 5	28th May, 1902	A	L. B. Age 7 Onset 31st May	3

Sore throat after the discharge of the infecting case, and after the illness of the return case.

61	A. G. Age 8	22nd Aug., 1901	A	F. G. Age 5½ Onset 27th August	5
120	M. C. Age 5	2nd Oct., 1901	C	S. D. Age 2 Onset 11th October	9
159	T. W. Age 9	26th Oct., 1901	A	E. W. Age 2 Onset 30th October	4
213	L. J Age 6	29th Nov., 1901	A	L. J. Age 4 Onset 1st December	2

On 29th October, Mrs. R. had headache and sore throat. On the 30th October, her throat was worse.

On 19th November, E. K., aged 8, had headache, sore throat and vomiting, but no rash. Wearing apparel fumigated, but not washed afterwards.

On 7th December, V. T., aged 9, had headache, sore throat, shivering and enlarged glands. No rash or desquamation observed. *Disinfection.*—Bedding and clothes fumigated.

On 24th December, A.G., aged 14, "skin flushed," glands palp. and tender; 24th to 26th, sore throat, head hot. No desquamation noticed.

On 25th March, Mrs. E had severe sore throat, headache, glands palp., tongue furred, feverish and felt very weak. Culture negative.

On 28th March, S. O., aged 3, had headache, feverish, restless, vomiting, enlarged glands and sore throat. No rash.

On 31st May, Mrs. B was attended by her doctor who said that her throat was ulcerated and he suspected scarlet fever. Glands were enlarged (right and left), tongue furred, shivering. On June 5th tonsils plugged with secretion, glands enlarged, nasal catarrh. Bedding, etc., fumigated.

August 31st, R. G., aged 12, was taken ill with headache, shivering (lasted two days), flushed face, sore throat, and pain in the side. September 1st, fauces much injected, tonsils enlarged, and secretion on both. Tongue furred, papillæ prominent. Patient feels ill. No rash.

Mrs. D. was taken ill 16th October. Had severe sore throat; was ill 6 days.

When return case was taken ill Mrs. W. had a sore throat. On 6th November, could "hardly stand" and felt very ill. Careful observation was made for scarlet fever rash, but none was discovered.

Mrs. J. was taken ill 5th December. Pains all over, etc.

No. of Case.	Infecting Case. Name and Age.	Date of Discharge.	Classification.	Return Case. Name, Age and Onset of Illness.	Interval (in days)
210	M. D. Age 5	9th Nov., 1901	C	F. D. Age 11 Onset 25th November	16
211	F. D. Age 11	7th Jan., 1902	C	N. D. Age 3 Onset 4th February	28
222	J. W. Age 5	27th Nov., 1901	A	E. W. Age 13 Onset 29th November	2
237	F. H. Age 4	22nd Nov., 1901	A	N. H. Age 8 Onset 3rd December	11
296	A. F. Age 4	24th Dec., 1901	C	H. F. Age 7 Onset 27th December E. F. Age 2 Onset 30th December	3 6
341	A. N. Age 6	14th Jan., 1902	A	F. N. Age 2 Onset 20th January	6
418	A. D. Age 9	24th Feb., 1902	A	A. D. Age 7 Onset 27th February	3
440	S. P. Age 3	7th March, 1902	A	H. P. Age $\frac{9}{12}$ Onset 11th March	4
557	V. N. Age $\frac{7}{12}$	26th May, 1902	A	A. N. Age $2\frac{1}{2}$ Onset 29th May	3
599	E. B. Age $3\frac{1}{2}$	14th July, 1902	A	C. B. Age $1\frac{10}{12}$ Onset 18th July	4

C. D., aged 6, was taken ill 6th December. Symptoms—headache, vomiting, sore throat, backache, "flushed face." No rash. There are 6 children in the family. All contracted scarlet fever except C. D. and an infant.

L. W., aged 11, was taken ill 29th November with sore throat and enlarged glands.

On the 9th December, F. H., aged 10, and A. H., aged 15, were taken ill with sore throats. Mrs. H also had a sore throat about the same time.

Mr. and Mrs. F had sore throats immediately after the illness of both the infecting and return cases. Mr. F off duty and remained at home for 1 week.

Mrs. N was taken ill, 20th January, with very bad sore throat. Three children, all of whom have now had scarlet fever.

Mr. D was taken ill 13 March. Had sore throat, shivering, headache, anorexia, feverish, "light headed."

Mrs. P was taken ill 17 March, with tonsillitis. March 18th, had to keep to bed.

C. N., aged 6, was taken ill on 1st June, with sore throat, headache, vomiting, and enlarged glands. Mrs. N on 2nd June, with sore throat and nausea. C. N., is the only one out of a family of five, who has not had scarlet fever.

Mrs. B was taken ill 20th July. On July 28th, was in bed with tonsillitis.

Miscellaneous complaints associated with outbreaks of Scarlet Fever in the same house.

No of Case.	Name and Age.	Onset of illness.	Interval after previous Case.	Date of admission to Hospital.	Diagnosed in Hospital.
1	A. J.	12th May, 1902	...	13th May, 1902	Scarlet Fever
	B. J. Age 1½	18th May, 1902	6	...	Not certified
	Mrs. J. Age 28	21st May, 1902	3	...	Not certified
	E. J. Age 6	31st May, 1902	10	1st June, 1902	Scarlet Fever
	Mr. J. Age 30	4th June, 1902	4	...	Not certified
2	J. P. Age 19	6th Aug., 1901	...	7th Aug., 1901	Tonsillitis
	L. P. Age 3	22nd Aug., 1901	16	23rd Aug., 1901	Scarlet Fever
	E. P. Age 15	22nd Aug., 1901	16	23rd Aug., 1901	Tonsillitis
	E. P. Age 13	25th Aug., 1901	3	25th Aug., 1901	Tonsillitis
3	W. B. Age 3	25th Aug., 1901	...	27th Aug., 1901	Scarlet Fever
	Mrs. B.	27th Aug., 1901	2	...	Not certified
	Mr. B.	2nd Sept., 1901	6	3rd Sept., 1901	Scarlet Fever
4	Mr. M. Age 30	12th Dec., 1902	...	...	Not certified
	E. M. Age 3	14th Dec. 1902	2	15th Dec., 1902	Scarlet Fever
5	N. W. Age 13	9th Jan., 1903	9	10th Jan., 1903	Scarlet Fever
	Mrs. W.	9th Jan., 1903	...	...	Not certified
6	A. G. Age 5	24th Aug., 1902	...	25th Aug., 1902	Scarlet Fever
	Mrs. G. Age 40	25th Aug., 1902	1	...	Not certified
7	A	18th Aug., 1902	...	21st Aug., 1902	Scarlet Fever
	B	4th Sept., 1902	17	4th Sept., 1902	Scarlet Fever
	C	16th Sept., 1902	12	17th Sept., 1902	Scarlet Fever
8	R. C. Age 4	14th Nov., 1902	...	15th Nov., 1902	Scarlet Fever
	J. C. Age 2	...	...	...	Not certified
9	R. C. Age 4	20th Nov., 1902	...	21st Nov., 1902	Scarlet Fever
	H. C. Age 1½	...	...	...	Not certified
10	L. D. Age 3	17th Nov., 1902	...	...	Not certified
	A. D. Age 8	18th Nov., 1902	...	19th Nov., 1902	Scarlet Fever
	W. D. Age 13	...	...	...	Not certified

A. J. was taken ill with scarlet fever and admitted to hospital on May 12th. Six days later B. J., aged $2\frac{2}{12}$, was taken ill and said to be "teething." Three days later Mrs. J. suffered from sore throat, headache, and "influenza" pains. illness lasted a week. Ten days later, May 31st, E. J., aged 6, was taken ill and admitted to hospital with scarlet fever. Four days later Mr. J. had sore throat, and was obliged to stay at home two or three days.

All these cases were certified to be suffering from diphtheria.

Mrs. B., symptoms :—severe sore throat, headache, sickness, tongue furred and feverish. In bed for 10 days. W. B. (the first return case), aged 3, was infected by a brother (E. B., aged 6), who was discharged from hospital on 20th August.

M. M., aged 8, was discharged from hospital on 8th December. On 12th December Mr. M. had headache, severe tonsillitis, in bed a week. Pains all over, tongue furred, was unable to swallow for several days, very feverish. Off duty 3 weeks, felt very weak and lost flesh. No rash or desquamation observed. December 14th, E. M., aged 3, was taken ill and was admitted to hospital.

F. W., aged 7, was discharged from hospital on 31st December, 1902. Mrs. W. was taken ill about the same time as the return case. N. W., aged 13, tongue furred, headache, backache, anorexia, feverish, severe sore throat. Diagnosed "quinsy." Infecting case had purulent rhinorrhœa.

Mrs. G was taken ill about the same time as infecting case. Had severe sore throat, delirium stiff neck, very feverish, tongue like washleather at first, afterwards very tender.

The mother of these cases was in bed on the 18th, 19th, and 20th August, with severe sore throat and pains all over. Felt very ill.

P. C., aged 6, was discharged from hospital on 5th November. Since admission to hospital of return case, another child, aged 2, has had enlarged glands and bronchitis.

Six days after infecting case was discharged, R. C. was taken ill with scarlet fever, and another child, age 1½, about the same time had bronchitis and otorrhœa.

C. D., aged 2, was discharged from hospital on the 14th November. Louie, aged 3, day before return case was taken ill had sore throat, swollen neck, tongue? peeled, enlarged glands, and rhinitis. No rash or desquamation observed. A brother of these children W. D., aged 13, has "*mumps*" now, and is attending school.

II.

Recrudescence of Infection.

Recrudescence of Infection after Discharge.

Rhinorrhœa Cases.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case. (Interval).	Infecting Case. Complications in Hospital.
500	A	Infecting case S. W.	1	4		27th Mar., 1902		Otorrhœa
		Return case G. W.	2	10	17th April, 1902		11	
439	A	Infecting case G. S.	1	7		12th Feb., 1902		Endocarditis
		Return case S. S.	2	2	23rd Feb., 1902		11	
		Return case P. S.	3	3	23rd ditto			
		Return case C. S.	4	6	23rd ditto			
		Return case L. S.	5	$2^{9}/_{12}$	25th ditto		13	
127	A	Infecting case C. A.	1	4		28th Sept., 1901		Rhinorrhœa
		Return case A. A.	2	12	12th Oct., 1901		14	
399	A	Infecting case D. W.	1	4		20th Jan., 1902		Varicella
		Return case D. W.	2	$1\frac{1}{2}$	23rd Jan., 1902		3	
		Return case W. W.	3	10	28th ditto			
		Return case J. W.	4	12	30th ditto		5	
518	A	Infecting case R. H.	1	2		14th April, 1902		Rhinorrhœa and otorrhœa
		Return case E. H.	2	8	1st May, 1902		17	
220	A	Infecting case F. A.	1	5		16th Nov., 1901		Rhinorrhœa and otorrhœa
		Return case A. A.	2	6	1st Dec., 1901		15	
378	A	Infecting case G. M.	1	5		25th Jan., 1902		Rhinorrhœa
		Return case C. M.	2	$3\frac{1}{2}$	10th Feb., 1902		16	
254	A	Infecting case H. C.	1	$1^{10}/_{12}$		12th Dec., 1901		Rhinorrhœa
		Return case M. C.	2	3	15th Dec., 1901		3	

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Otorrhœa and rhinorrhœa	Clothes not disinfected, but "smothered in carbolic"	3 (ages 12, 6 and 1)	The second night after infecting case returned home, there was a discharge from his ear. Seven days after return he had rhinorrhœa. Four days later, return case was taken ill. The discharge was green and bloodstained.
Rhinorrhœa	Satisfactory	1 (age 5)	Eight days after infecting case returned home, rhinorrhœa began. Three days later return cases were taken ill.
Rhinorrhœa	Satisfactory		Spots came out on face 3 days after "infecting case" came home. Nose was sore inside on day of discharge.
Rhinorrhœa	Bedding and room disinfected. Clothes washed at home	Nil	On discharge from hospital, glands on right side were swollen. Seven days after discharge, nose began to run, preceded a day or two by impetigo on the face.
Rhinorrhœa	Satisfactory	3 (ages 5, 10 and $^7/_{12}$)	Two or three days after his return a discharge from the nose came on. Fourteen days later return case was taken ill.
Rhinorrhœa	Satisfactory	Nil	Twelve days after discharge, rhinorrhœa recurred. Three days later return case was taken ill.
Rhinitis and discharge	Satisfactory	1 (age $^8/_{12}$)	Twelve days after infecting case came home, her nose became sore. Parent does not think she caught cold. Four days later return case was taken ill. Rhinorrhœa had ceased 14 days before discharge.
Rhinorrhœa	Satisfactory	Nil	A day or two after infecting case came home, he had a slight running from the nose.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case (Interval).	Infecting Case. Complications in Hospital.
425	A	Infecting case D. J.	1	6		5th March, 1902		Nil
		Return case C. J.	2	8	12th March, 1902		7	
171	C	Infecting case N. G.	1	5		17th Oct., 1901		Nil
		Return case E. G.	2	3	21st Nov., 1901		35	
70	C	Infecting case J. L.	1	6		21st Aug., 1901		Nil
		Return case A. L.	2	10	6th Sept., 1901		16	
		Return case L. L.	3	9	9th Sept., 1901		19	
168	A	Infecting case W. S.	1	5	-	9th Nov., 1901		Nil
		Return case M. D.	2	14	18th Nov., 1901		9	
		Return case A. D.	3	8	20th Nov., 1901		11	
247	A	Infecting case J. G.	1	1		30th Nov., 1901		Otorrhœa and nephritis
		Return case O. G.	2	2	12th Dec., 1901		12	
8	A	Infecting case L. S.	1	5		25th May, 1901		Rhinorrhœa
		Return case E. S.	2	4½	27th June, 1901		32	
		Return case M. S.	3	20	29th June, 1901		34	
		Return case C. S.	4	3	1st July, 1901		36	
131	A	Infecting case P. C.	1	1½		12th Oct., 1901		Nil
		Return case R. C.	2	10	23rd Oct., 1901		11	
		Return case D. C.	3	$\frac{5}{12}$	4th Nov., 1901		23	

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Otorrhœa and rhinorrhœa	Room and bedding disinfected. Clothes washed at home	1 (age 1¼)	Three days after discharge, infecting case had double ottorrhœa and purulent rhinorrhœa. Four days later return case was taken ill. The rhinorrhœa lasted a week, but the otorrhœa was present 3 weeks after it commenced.
Rhinitis and some discharge	No bedding or clothes disinfected	2 (ages 7 and $^{4}/_{12}$)	About 27 days after discharge (13th Nov.), infecting case's nose became sore and there was some discharge. Seven days later return case was taken ill.
Rhinorrhœa	Satisfactory	Nil	Seven days after infecting case came home, he had a green discharge from his nose. It was only present on two occasions. Nine days later return case was taken ill.
Rhinorrhœa and otorrhœa	Room disinfected. Bedding ditto. Clothes washed at home	In house of infecting case, 2 (ages 2 & 9 weeks). In house of return case 2 (ages 6 and 18)	Seven days after W. S. (infecting case) came home, he had otorrhœa, rhinorrhœa and swollen glands. Two days later the first return case (M. D.) was taken ill. M. D. is a domestic servant in the house of infecting case. She sleeps at home with A. D., the second return case.
Rhinorrhœa	Satisfactory	Nil	Four days after discharge, rhinorrhœa commenced. Eight days later return case was taken ill. The rhinorrhœa was thick for the first two days, afterwards watery.
Rhinorrhœa	Satisfactory	Nil	L. S. (infecting case) was perfectly well when discharged, but 14 days later (8th June) complained of sore throat, and on the following day there was a thick blood-stained nasal discharge and "a small lump the size of a pea came away." For some time afterwards the discharge was watery. 17 days after the rhinorrhœa began the first return case, E. S., aged 4, occurred. The next return case, M. S., a maid servant, was never notified, but went about her duties desquamating. *The infecting case (L. S.) was admitted to hospital with a second attack* on August 28th, or a little over five months after her first attack. The return cases were still in hospital when the second attack began.
Rhinorrhœa	Clothes washed at home, bedding and room disinfected	Nil	Two days after discharge of infecting case, rhinorrhœa began. The discharge which was thick, was present chiefly in the morning. Nine days later the first return case (R. C.) was taken ill.

Rhinitis Cases.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case (Interval).	Infecting Case. Complications in Hospital.
235	A	Infecting case F. B.	1	2		6th Nov., 1901		Rhinorrhœa and otorrhœa
		Return case E. B.	2	6	9th Dec., 1901		33	
422	A	Infecting case C. S.	1	9		31st Jan., 1902		Nil
		Return case G. S.	2	18	24th Feb., 1902		24	
		Return case J. S.	3	4	25th Feb., 1902		25	
479	C	Infecting case M. S.	1	2		28th Feb., 1902		Relapse of scarlet fever and rhinorrhœa
		Return case A. S.	2	8	27th Mar., 1902		27	
296	C	Infecting case A. F.	1	4		24th Dec., 1901		Nil
		Return case H. F.	2	7	27th Dec., 1901		3	
		Return case E. F.	3	2	30th Dec., 1901		6	

Cases that suffered from a cold or cough.

410	A	Infecting case A. H.	1	8		3rd Feb., 1902		Nil
		Return case L. H.	2	5	12th Feb., 1902		9	
530	A	Infecting case M. B.	1	4		12th April, 1902		Nil
		Return case A. B.	2	3	25th April, 1902		13	
118	A	Infecting case R. K.	1	6		9th Oct., 1901		Nil
		Return case M. K.	2	2	17th Oct., 1901		8	
499	A	Infecting case A. H.	1	7		28th March, 1902		Nil
		Return case M. H.	2	1	8th April, 1902		11	
203	C	Infecting case K. B.	1	10		6th Nov., 1901		Nil
		Return case M. B.	2	16	10th Nov., 1901		4	
		Return case L. B.	3	9	21st Nov., 1901		15	
		Return case E. B.	4	2	1st Dec., 1901		25	

Condition of Patient after Discharge.	Disinfection.	Susceptible Children	Remarks.
Rhinitis	Clothes washed at home	Nil	Twenty-one days after the infecting case (F. B.) came home he "had a sore nose" Three days later the father of infecting case was taken ill with "symptoms of scarlet fever." No rash or peeling seen. The second return case (E. B.) was from home until 5th December. Four days later she was taken ill with scarlet fever.
Rhinitis	Clothes disinfected	Nil	Three to four days before return cases were taken ill the infecting case had a sore nose.
Rhinitis	Satisfactory	2 (ages 10 & 1)	Twenty-two days after infecting case came home his nose became very red and sore and he was re-admitted to hospital. Five days later return case was taken ill.
Rhinitis	Clothing washed at home	1 (age 10)	Nose became sore and there was a breaking out about the nose soon after A. F. came home.

Cold and cough	Satisfactory	Nil	Infecting case had a cold in the head and cough the day return case was taken ill. Quite well before.
Nasal catarrh and excoriation	Satisfactory	Nil	The night he returned from hospital he was feverish. Next morning the nose began to run. The nose became sore, and the watery discharge became bloodstained.
Nasal catarrh	Satisfactory	1 (age $^{9}/_{12}$)	Two days after return of infecting case, he had a cold in the head. Six days later return case was taken ill.
Sore throat and swollen glands	Clothes disinfected	Nil	The infecting case had sore throat and swollen glands the day after discharge from hospital.
Glands swollen	Clothes fumigated	4 (ages 21, 18, 14 & $^{9}/_{12}$)	Infecting case had swollen glands after discharge.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case (Interval).	Infecting Case. Complications in Hospital.
277	A	Infecting case C. O.	1	37		25th Oct., 1901		Nil
		Return case R. O.	2	9	9th Nov., 1901		15	
		Return case E. O.	3	8	17th Nov., 1901		23	
		Return case S. O. .	4	2½	1st Dec., 1901		37	
318	C	Infecting case A. C.	1	9		18th Dec., 1901		Nil
		Return case A. C.	2	5	29th Dec., 1901		11	
		Return case J. C.	3	3	7th Jan., 1902		20	
370	A	Infecting case J. L.	1	5		23rd Jan., 1902		Nil
		Return case B. L.	2	4	8th Feb.,* 1902		16	
32	A	Infecting case A. G.	1	8		25th July, 1901		Nil
		Return case J. G.	2	6	29th July, 1901		4	
		Return case F. G.	3	4	31st July, 1901		6	
92	A	Infecting case S. B.	1	17		4th Sept., 1901		Nil
		Return case G. B.	2	3	29th Sept., 1901		25	
119	A	Infecting case E. E.	1	10		11th Sept., 1901		Pneumonia and nephritis
		Return case A. E.	2	13	14th Sept., 1901		3	
		Return case G. E.	3	12	6th October, 1901		25	

Otorrhœa Cases.

531	A	Infecting case H. R.	1	4		1st May, 1902		Nil
		Return case A. R.	2	2	6th May, 1902		5	
103	A	Infecting case F. B.	1	7		26th Sept., 1901		Rhinorrhœa, relapse of scarlet fever, rheumatism and endocarditis
		Return case A. B.	2	1½	2nd Oct., 1901		6	

*Date rash appeared.

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Sore throat	Satisfactory	4 (ages 12, 10, 6 and 5)	Infecting case had a bad sore throat for some days after she came home. The return cases occurred at intervals of 15, 8 and 14 days respectively.
Sore throat	Clothing disinfected	1 (age $1\,^{3}/_{12}$)	Infecting case had cough and sore throat the night he was discharged.
Sore throat	Clothing disinfected	Nil	*Infecting case* was not well on the 29th. He complained of headache. On the 30th his throat was slightly sore. *Return case* was taken ill two days after infecting case was discharged. He was attended by his doctor for a sore throat up to the 27th. He apparently recovered until the 8th February when the rash was discovered.
Sore throat and post-nasal discharge	Satisfactory	4 (ages 16, 14, 13 and 2)	Infecting case had a sore throat the day after he came home.
Sore throat	Coat of infecting case fumigated	1 (age 22)	Four days after returning home, infecting case complained of sore throat. Four days later his father was laid up with a sore throat. Seventeen days later return case was taken ill.
Sore throat and peeling.	Satisfactory	Nil	One day after discharge from hospital, infecting case had a sore throat, which lasted a week. About two weeks later, peeling was observed. He has also had a cough since discharge. *Note the interval between the 1st and 2nd return cases.*

Otorrhœa and enlarged glands	Satisfactory	1 (age 9)	Two days after infecting case came home otorrhœa began. His glands were swollen on discharge.
Otorrhœa	Clothes disinfected	Nil	Six days after infecting case came home otorrhœa began. Same day return case was taken ill.

No. of Case.	Classification		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case (Interval).	Infecting Case. Complications in Hospital.
218	A	Infecting case C. T.	1	4		27th Nov., 1901		Nil
		Return case L. R.	2	4	1st Dec., 1901		4	
		Return case H. T.	3	1	2nd Dec., 1901		5	
438	A	Infecting case A. T.	1	4		8th Feb., 1902		Nil
		Return case M. T.	2	2	21st Feb., 1902		13	
489	A	Infecting case H. C.	1	3		7th March, 1902		Otorrhœa
		Return case A. C.	2	5	16th March, 1902		9	
168	A	Infecting case W. S.	1	5		9th Nov., 1901		Nil
		Return case W. D.	2	14	18th Nov., 1901		9	
		Return case A. D.	3	8	20th Nov., 1901		11	
393	C	Infecting case S. C.	1	5		8th Feb., 1902		Nil
		Return case A. C.	2	1½	16th Feb., 1902		8	
392	B	Infecting case C. H.	1	2		11th Jan., 1902		Otorrhœa
		Return case W. H.	2	4	7th Feb., 1902		27	
283	A	Infecting case W. Y.	1	6		17th Dec., 1901		Otorrhœa
		Return case W. Y.	2	2	4th Jan., 1902		18	
187	B	Infecting case C. A.	1	6		2nd Nov., 1901		Nil
		Return case R. A.	2	5	16th Nov., 1901		14	
		Return case G. A.	3	4	22nd Nov., 1901		20	

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Rhinorrhœa and otorrhœa	Satisfactory	1 (age 9)	The day after she returned home, there was a thick bloodstained yellow discharge from the nose. Four days after discharge from hospital otorrhœa began. On December 5th, A. T., aged 9, suffered from headache, sore throat, swollen neck and shivering, no rash seen.
Otorrhœa	Satisfactory	Nil	Three days after infecting case returned home, he had ear discharge. Ten days later return case was taken ill.
Otorrhœa	Clothes washed at home	1 (age 1)	About 9 days after discharge from hospital, otorrhœa began, and the return case was taken ill.
Rhinorrhœa and otorrhœa	Room disinfected. Bedding taken away; clothes not taken away but washed at home	4 (ages 18, 6, 2 and $^{9}/_{52}$)	Seven days after infecting case came home, he had otorrhœa, rhinorrhœa, and swollen glands. Two days later return case was taken ill.
Otorrhœa and nasal catarrh, fauces morbid	Clothing fumigated	4 (ages 7, 5, 4 and 3)	After discharge from hospital, the infecting case suffered from otorrhœa and nasal catarrh. A series of cases occurred in this house at intervals of 11, 16 and 40 days after the primary outbreak. The last case was the "return case."
Otorrhœa	Wearing apparel washed at home	1 (age 8)	The otorrhœa came on the day after discharge from hospital. Return case was not taken ill for 26 days later.
Otorrhœa and sore nose	Satisfactory	1 (age 4)	Patient had rhinitis at the time of discharge from hospital, and 15 days after returning home, he had a return of the otorrhœa. Three days later return case was taken ill.
Otorrhœa	Satisfactory. Drainage defective. House dilapidated	Nil	Seven days after discharge from hospital, otorrhœa came on. Seven days later return cases were taken ill. *Disinfection.* The return cases were nursed during the day in a perambulator for a few days before they contracted scarlet fever. The perambulator was used by the infecting case when he contracted scarlet fever and had not been disinfected.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case (Interval).	Infecting Case. Complications in Hospital.
350	B	Infecting case S. W.	1	7		23rd Dec., 1901		Otorrhœa
		Return case G. W.	2	12	1st Feb., 1902		40	
245	B	Infecting case F. R.	1	12		15th Oct., 1901		Nil
		Return case G. R.	2	13	13th Dec., 1901		59	

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Otorrhœa	Clothing disinfected	1 (age 3)	Otorrhœa began 37 days after he returned home. Three days later return cases were taken ill.
Otorrhœa	Satisfactory	3 (ages 9, 7, and 3)	Fourteen days after infecting case returned home, otorrhœa began, and lasted 3 days. Return case, who was taken ill, 45 days later, possibly contracted infection at school.

Recrudescence of infection at the time of Discharge.

No. of Case.	Primary Case Name and Age.		Date of Discharge.	No. of days in Hospital.	Complications in Hospital.	Condition after Discharge.	Classification.
296	A. F.	Age 4	24th Dec., 1901	69	Nil	Nose excoriated	C
12	A. W.	Age 6	5th July, 1901	137	Relapse of scarlet fever, rhinorrhœa during first attack	Rhinorrhœa	A
89	W. H.	Age 13	28th Aug., 1901	71	Nil	Rhinorrhœa	A
597	J. O.	Age 5	21st July, 1902	46	Rhinitis	Rhinorrhœa	A
620	A. W.	Age 6	25th July, 1902	56	Nil	Rhinorrhœa	A
311	M. R.	Age 6	6th Jan., 1902	61	Sore nose	Sore throat and enlarged glands	A
106	A. O.	Age 4	21st Sept., 1902	94	Excoriation of nose	Sore nose	A
469	D. E.	Age 7	20th Mar., 1901	65	Rhinitis	Rhinorrhœa	A
40	E. R.	Age 7	27th July, 1901	65	Nil	Rhinorrhœa	A
51	C. F.	Age 3	3rd Aug., 1901	67	Nil	Rhinorrhœa	A
60	J. S.	Age 4	24th Aug., 1901	66	Nil	Rhinorrhœa	A
556	W. H.	Age 12	5th June, 1902	56	Nil	Rhinorrhœa	A

Return Case. Name, Age and Onset of Illness.	Interval.	Remarks.
H. F. Age 7 Onset 27th December	3	Breaking out about nose (impetigo) soon after he came home.
H. W. Age 5 Onset 10th July	5	Had relapse of scarlet fever 74 days before discharge. Had rhinorrhœa the day he arrived home.
E. H. Age 8 Onset 3rd September	6	Patient had rhinorrhœa, green and blood-stained, the day he came home, lasted 3 days.
W. O. Age 3 Onset 24th July	3	Had rhinitis on discharge. Yellow blood-stained discharge on arriving home.
W. W. Age 6 Onset 31st July	6	Thick discharge from nose when patient arrived home.
W. R. Age 2 Onset 14th January	8	Patient had a sore nose and a cold in the head the day he returned home. Sore throat and enlarged glands the day after discharge.
J. O. Age 2 Onset 3rd October	12	Had sore nose from time to time in hospital and "was discharged with same."
R. E. Age 10 Onset 25th March	5	Had rhinitis day of discharge. Rhinorrhœa occurred during the same evening.
F. R. Age 9 Onset 7th August	11	Patient had sore nose day of discharge. Yellow blood-stained rhinorrhœa when she arrived home.
L. H. Age 5½ Onset 7th August	4	Patient had rhinorrhœa day after discharge.
M. S. Age 2½ Onset 28th August	4	Patient's nose looked swollen day of discharge. Yellow discharge next day.
F. W. Age 6 Onset 8th June	3	Two days after discharge patient's nose bled. There was pus and blood on the handkerchief.

Recrudescence of infection before Discharge.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case (Interval).	Infecting Case.
								Complications in Hospital.
390	A	Infecting case F. K.	1	5		3rd Feb., 1902		Tonsillitis, rhinorrhœa, and otorrhœa
		Return case J. K.	2	12	5th Feb., 1902		2	
		Return case W. K.	3	8	8th Feb., 1902			
71	C	Infecting case S. H.	1	5		5th Sept., 1901		Tonsillitis and rhinitis
		Return case E. H.	2	8	9th Sept., 1901		4	
517	A	Infecting case R. D.	1	18		16th April, 1902		Tonsillitis
		Return case W. D.	2	13	1st May, 1902		15	
		Return case S. D.	3	21	2nd May, 1902			
Oct. 1	A	Infecting case G. G.	1	23		3rd Sept., 1901		Tonsillitis
		Return case Mr. E.	2	30	19th Sept., 1901		16	
		Return case Mrs. E.	3	26	23rd Sept., 1901			
609	A	Infecting case G. L.	1	5		15th July, 1902		Adenitis
		Return case H. C.	2	5	21st July, 1902		6	
		Return case G. L.	3	32	22nd July, 1902			
B	C	Infecting case S. S.	1	5		10th Dec. 1902		Rhinorrhœa
		Return case A. K.	2	3	16th Dec., 1902		6	
290	A	Infecting case W. B.	1	4		3rd Jan., 1902		Tonsillitis
		Return case C. B.	2	6	9th Jan., 1902		6	
43	A	Infecting case A. M.	1	$3\frac{1}{2}$		3rd Aug., 1901		Rhinorrhœa, relapse of scarlet fever
		Return case E. M.	2	$2^{11}/_{12}$	10th Aug., 1901		7	

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Nil	Clothes disinfected	1 (age $^9/_{12}$)	On 14th January, 1902, sore throat, "tonsillitis." On 17th January, rhinorrhœa (lasted 3 days). On 24th January, otorrhœa (lasted 4 days). On 3rd February, or 20 days after the commencement of this illness infecting case was discharged.
Rhinitis	Clothes fumigated. Some washed afterwards.	1 (age 1½)	Infecting case had tonsillitis 7 days before discharge, and on the day of discharge his nose was sore.
Fauces injected	Clothes disinfected	1 (age 7)	Patient had tonsillitis during convalescence. In hospital 46 days. Fauces injected after discharge.
Nil	Satisfactory	1 (age 1)	Three days after infecting case was discharged he went to the country. He was away 8 days. Five days after he returned his brother-in-law, Mr. E., living in the same house, was taken ill. Infecting case had tonsillitis a few days before discharge.
Nil	Satisfactory	1 (age 3)	Infecting case had secondary adenitis. Was in hospital 8 weeks.
Nil	Satisfactory	Nil	Tonsillitis ceased 14 days before discharge. Measles 47 days before discharge.
Nil	Satisfactory	1 (age 1)	Tonsillitis occurred on 22 days before discharge.
Fissure behind the ear	Satisfactory	2 (age $3^{11}/_{12}$)	Had a relapse of scarlet fever 37 days before discharge.

III.

Long Interval Cases.

In the following cases the Infecting and Return Cases did not come in contact

No of Case.	Primary Case. Name and Age	Date of Discharge.	No. of days in Hospital.	Complication in Hospital.	Condition after Discharge.	Classification.
D	B. C. Age 6½	12th Dec., 1902	45	Nil	Rhinorrhœa on evening of discharge, at first purulent, later watery and intermittent	A
177	G. W. Age 9	9th Nov., 1901	49	Nil	Fauces not healthy	A
477	L. D. Age 2	28th March, '02	73	Tubercular abscesses in neck	Tubercular abscesses in neck discharging	A
558	G. P. Age 5	10th May	68	Nil	Rhinitis, chronic enlarged glands	A

until some time after the former was discharged from hospital.

Return Case. Name, Age and onset of illness.	(Interval).	Disinfection.	Remarks.
A. C. Age 1½ Onset 19th Dec., 1902 (died)	7	Satisfactory	A. C., aged 8, and J. C., aged 9, were sent to the country the day B.C. was discharged. They were away ten weeks, returning home on February 18th. During the whole time the "infecting case" had rhinitis off and on, and the nose was a little sore when the "return cases" came back. Consequently B. C. was kept apart from the return cases until February 22nd. Eight days after this temporary quarantine, A. C. was taken ill, followed by J. C. two days later. The "return cases" had been out very little since their return from the country. The "infecting cases" went to the seaside on January 17th and remained there 14 days.
A. C. Age 8 Onset 1st March, 1903	79		
J. C. Age 9 Onset 3rd March, 1903	81		*Disinfection.*—The disinfection was exceptionally well done. In the first instance when the "infecting case" was taken ill, and again after he came home. The clothes worn after he returned from hospital were disinfected. Everything belonging to him was kept separate and marked. The sitting-room as well as the boy's bedroom were disinfected before the "return cases" came back from the country. Every room in the house had a thorough cleaning. Everything that could be washed—boiled. Several of the rooms were re-papered, and the hall and passages were washed down with an antiseptic solution. The house is not a small one, and the parents of the children carried out the instructions given to them with the greatest care.
L. W. Age 7 Onset 18th November	9	Satisfactory	Nine days after "infecting case" returned home, the first "return case" was taken ill. "Infecting case" then went on a visit to her cousins ("return cases" 2 and 3) who live in the country. Nine days later "return case" 2 was taken ill, followed by "return case" 3.
G. W. Age 2 Onset 27th November	18		
C. W. Age 4 Onset 1st December	22		
W. D. Age 3 Onset 11th April	14	Satisfactory	L. D., "infecting case," on leaving hospital went to his grandmother's house and remained there until April 6th (9 days), and then returned home. Five days later "return case" was taken ill.
E. P. Age 6 Onset 27th May	17	Patient's clothes were disinfected	E. P., "return case," was from home when "infecting case" was discharged. She returned on the 17th May, Ten days later she contracted scarlet fever.

No. of Case.	Primary Case. Name and Age.		Date of Discharge.	No. of days in Hospital.	Complication in Hospital.	Condition after Discharge.	Classification.
14 Aug 1903.	R. C.	Age 19	15th June	49	Cold in the head	Purulent rhinorrhœa	A
375	E. R.	Age 10	5th February	74	Nil	Rhinitis	A
435	A. D.	Age 2	23rd January	74	Suppurative adenitis	Nil	C
2 Nov., 1903.	W. C.	Age 5	29th August, 1903	83	Otorrhœa, stomatitis, mastoid abscess, post-nasal catarrh	Fauces injected, post-nasal catarrh	A
A	J. C.	Age 23	Under treatment 8 weeks	56	Rhinorrhœa	Running from the nose	A
	H. C.	Age 6	16th January	71	Nil	Running from the nose for several weeks	A
52	A. L.	Age 11	3rd August, 1901	43	Nil	Nil	C

Return Case.	(Interval).	Disinfection.	Remarks.
Name, Age and onset of illness.			
H. C. Age 4 Onset 16th July	31	Satisfactory	R. C., "infecting case," is a domestic servant. On leaving hospital she went to her home and remained there 22 days. On July 7th she returned to her situation. Nine days later (July 16th) her employer's children were taken ill both on the same day with scarlet fever. No other children in the house. The "return cases" do not go to school. "Infecting case" has had a "cold in her head ever since she has been home."
C. C. Age 3 Onset 16th July			
F. R. Age 10 Onset 10th February	5	Satisfactory	"Infecting case" went direct from hospital to the seaside on the morning of the 5th February, and returned at 6.30 p.m. on the 8th February.
H. R. Age 11 Onset 11th February	6		
D. D. Age 8 Onset 1st March	37	Satisfactory	"Return case" (D. D.) was from home when A. D. was discharged from hospital. They met first on 21st February. Nine days later "return case" was taken ill.
A. S. Age 19 Onset 19th September '03	21	Satisfactory	"Infecting case" (W. C.) after being home 13 days visited a relative at Bridport, eight days later "return case" (A. S.) was taken ill with scarlet fever. There had been no other case of scarlet fever in this village for several months until the "return case." The wearing apparel worn by the "infecting case" was bought for him the day before he went to the country. In infecting case's house their are no other children.
R. C. Age 16	30	Satisfactory	"Infecting case," a hospital nurse, after recovering from scarlet fever went to the seaside accompanied by her sister the "return case." They were from home a month and during that time were constantly together. While at the sea, "infecting case" suffered from an intermittent discharge from the nose. The sisters occupied separate beds until the night they returned home. Two days later "return case" was taken ill.
W. C. Age 2	37	Satisfactory	After H. C., the "infecting case," left hospital she went direct to her aunt's house and remained there from a fortnight to three weeks. About 20 days after she returned home the "return cases" were taken ill.
W. C. Age 8			
E. L. Age 15 Onset 19th August	16	Satisfactory	A. L., "infecting case," went to the seaside from August 6th to 16th. His brothers were taken ill three and four days after he returned home. There are no other young persons in the house.
S. L. Age 12 Onset 20th August	17		

No. of Case.	Primary Case. Name and Age.		Date of Discharge.	No. of days in Hospital.	Complication in Hospital.	Condition after Discharge.	Classification.
153	A. D.	Age 21	12th October, 1901	45	Nil	Nil	C
4 Nov., 1902.	H. P.	Age 6½	24th Sept., 1902	62	Nil	Rhinorrhœa, purulent the day after return from Hospital	A
30 Sep. 1902.	G. T.	Age 3	30th August, 1902	61	Nil	Rhinorrhœa off and on since his return home	A
1 Oct.	G. G.	Age 23	3rd September	47	Sore throat 4 or 5 days before discharge and was sent back to bed	Nil	A

Return Case. Name, Age and onset of illness.	(Interval).	Disinfection.	Remarks.
A. H. Age 18 Onset 11th November	30	Satisfactory	A. H., "return case," who is a domestic servant, visited her sister A. D. on the 6th November and spent the day with her. Five days later she was taken ill with scarlet fever.
B. N. Age 33 Onset 7th October E. P. Age 9 Onset 13th October A. P. Age 4 Onset 21st October C. P. Age $1\frac{5}{12}$ Onset 24th October	13 19 27 30	Satisfactory	When the "infecting case" was discharged he went to stay with his aunt, B. N., aged 33 years. On October 7th, that is after an interval of 13 days, she was taken ill with scarlet fever, On the following day, October 8th, he returned to his mother's house, where an attempt was made to isolate him. Five days later his brother E. P., aged 9 years, contracted scarlet fever. All the remaining susceptible children were subsequently attacked.
J. T. Age 10 Onset 13th September	14	Satisfactory	G. T. went to the seaside from the 2nd to 8th September. Five days later "return case" was taken ill. One other boy in the same house, but up to the time of my visit had not contracted scarlet fever.
Mrs. E. Age 26 Onset 23rd September	20	Clothes burnt, bedding and room disinfected	G. G., aged 23 years, on discharge from hospital, went to stay at Mr. E's house. Three days later, September 6th, he left for the country and was away eight days. Five days after he returned, Mr. E. was taken ill with headache, sore throat, vomiting, shivering, and pains all over. The doctor examined him carefully each day for a week, but no rash was detected. Four days after his illness commenced his wife developed scarlet fever and was admitted to hospital.

The Infecting Cases in the following cases suffered from a chronic morbid condition

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case. (Interval).	Infecting Case.
								Complications in Hospital.
230	B	Infecting case R. A.	1	5		11th Oct., 1901		Otorrhœa and rhinorrhœa
		Return case W. A.	2	7	28th Nov., 1901		48	
		Return case R. A.	3	16	1st Dec., 1901			
544	C	Infecting case C. B.	1	4		12th April, 1902		Otorrhœa
		Return case M. M.	2	4	19th May, 1902		37	
581	C	Infecting case E. P.	1	14		1st May, 1902		Nil
		Return case M. P.	2	4	14th June, 1902		44	
		Return case H. P.	3	9	17th June, 1902			
228	C	Infecting case F. B.	1	8		17th Oct., 1901		Nil
		Return case E. B.	2	12	28th Nov., 1901		42	
58	C	Infecting case E. B.	1	7		24th July, 1901		Rhinorrhœa
		Return case M. B.	2	4	25th Aug., 1901		32	
340	C	Infecting case L. A.	1	4		18th Dec., 1901		Tonsillitis
		Return case D. A	2	$1^2/_3$	24th Jan., 1902		37	
347	C	Infecting case J. F.	1	4		31st Dec., 1901		Nil
		Return case T. F.	2	13	20th Jan., 1902		20	
372	C	Infecting case G. B.	1	5		18th Dec., 1902		Chronic rhinorrhœa
		Return case M. B.	2	4	27th Jan., 1902		40	
422	A	Infecting case C. S.	1	9		31st Jan., 1902		Nil
		Return case G. S.	2	18	24th Feb., 1902		24	
		Return case J. S.	3	4	25th Feb., 1902			

after leaving hospital.

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Chronic ear discharge	Clothes washed at home	Nil	The infecting case had chronic ear discharge after return home from hospital. W. A. attends school.
Rhinitis and catarrh	Clothes disinfected. Dirty house	1 (age 2)	Infecting case has had a sore nose and running since he has been home.
Rhinitis	Clothes washed at home	2 (ages 7 and 17)	About a fortnight after infecting case came home she had a sore nose which continued up to the time return case was taken ill.
Running from nostril	Clothes washed at home	3 (ages 2, 10 and 14)	Infecting case had a running from the nostril ever since his discharge from hospital. No cases in the school.
Slight discharge from nose	Clothes washed at home	5 (ages 5, 12, 20, 21 and 22)	Infecting case had slight discharge from nose ("dirty nose") ever since her return from hospital. Infecting case and return case live in the same house. Infecting case slept with her sister, aged 12. A case of scarlet fever next door.
Bronchitis and eczema	Clothes washed at home	3 (ages 6, 8 and 14)	Two days after infecting case was home she developed bronchitis and was in bed 3 weeks, during which time eczema behind the ears appeared. Source of infection of return case not known, but possibly the discharged patient.
Nasal catarrh	Bedding disinfected. Clothes and sheets washed at home	5 (ages 2, 7, 9, 11 and 16)	A week after infecting case came home he had a bad cold with running from the nose. The nose became very red and sore. House dirty and insanitary.
Running from nose	Clothing disinfected. House cold and dirty	1 (age 3)	Infecting case had a watery running from the nose up to the time return case was taken ill. There were no other cases in the school
Rhinitis	Satisfactory	Nil	Infecting case was quite well until a few days before the return case was taken ill. His nose got sore.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case. (Interval).	Infecting Case.
								Complications in Hospital.
442	B	Infecting case K. G.	1	14		5th Feb., 1902		Nephritis, post scarlatinal diphtheria
		Return case W. G.	2	23	12th March, 1902		35	
		Return case E. G.	3	16	12th April, 1902			
	A	Infecting case J. C.	1	23		Under treatment 8 weeks	30	Rhinorrhœa
		Return case R. C.	2	16				
534	B	Infecting case S. W.	1	4		19th March, 1902		Nil
		Return case D. W.	2	7	9th May, 1902		51	
577	B	Infecting case E. W.	1	9		26th May, 1902		Nil
		Return case M. W.	2	8	19th June, 1902		24	
		Return case R. W.	3	14	14th June, 1902			
453	A	Infecting case E. H.	1	4		27th Feb., 1902		Nil
		Return case W. R.	2	3	12th March, 1902		13	
		Return case E. R.	3	6	14th March, 1902			
533	C	Infecting case R. K.	1	$^{11}/_{12}$		27th March, 1902		Nil
		Return case G.K.	2	7	20th April, 1902		24	
		Return case P. K.	3	5	25th April, 1902			

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Running from nose	Room into which patient was moved, disinfected, Bedding (but not sheets or blankets) disinfected. Clothes fumigated	Nil	A sister of infecting case was nursed at home and was quarantined 5 weeks. A few days after discharge from quarantine she infected her sister (K. G.) They were then both sent into hospital. *Home "return case."*
Running from nose	Satisfactory	Nil	Infecting case after recovery from scarlet fever went to the seaside accompanied by her sister, the return case, they were from home a month, and during that time were constantly together. While at the sea, infecting case suffered from an itermittent discharge from the nose. The sisters occupied separate beds until the night they returned home. Two days later return case was taken ill.
Adenitis	Satisfactory	Nil	Ten days after infecting case was home, he was laid up with swollen glands, and at the time the return case was also in bed with "ulcerated sore throat." He was ill three weeks. About 4 weeks later return case had another bad throat, but this time a scarlet fever rash was present. He was dangerously ill on admission. *The first illness of return case? abortive attack.*
Rhinitis (Septum injected, adherent scabs)	Dress fumigated, worn on discharge from hospital	1 (age 11)	Three weeks before infecting case was discharged return case L. W. was in bed with "a bad ulcerated throat." June 14th, he had another sore throat which continued for a week before the rash of scarlet fever appeared. *The first illness of return case? abortive attack.*
Nasal Catarrh and rhinitis	Satisfactory	3 (ages 11, 12 and 13)	Infecting case has had a cold since she has been home. Three or four days after she returned, a child (age $1^9/_{12}$) had an attack of toxic scarlet fever and died. The case was diagnosed "measles." The rash was suppressed.
Otorrhœa, glands swollen, eczema about the ear	When the children got ill they were moved into other rooms. The last room they occupied was disinfected. Dirty untidy home.	1 (age 5)	Otorrhœa began two days after patient was home, and the skin about the ear became eczematous. The glands were swollen on discharge. A series of cases occurred in the house as follows:—1st case: Onset of illness, 25th February. 2nd case: Onset of illness, 28th February; 3rd case (R. K.): Onset of illness, 11th March; 4th case (G. K.): Onset of illness, 20th April, interval 40 days after previous case or 24 after case 3 (R. K.) was discharged. 5th case (P. K.): Onset of illness, 25th April.

Cases in which the long "Interval" was due to Miscellaneous causes.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case. (Interval).	Infecting Case.
								Complications in Hospital.
521	B	Infecting case C. H.	1	8		19th March, 1902		Nil
		Return case M. H.	2	10 weeks	24th April, 1902		36	
92	A	Infecting case S. B.	1	17		4th Sept., 1901		Nil
		Return case G. B.	2	3	29th Sept., 1901		25	
152	A	Infecting case E. C.	1	9		19th Oct., 1901		Nil
		J. C.	2	4				
		Return case H. C.	3	2½	1st Nov., 1901		13	
552	B	Infecting case E. W.	1	7		14th April, 1902		Otorrhœa and rhinorrhœa
		Return case W. W.	2	14	26th May, 1902		42	
		Return case R. W.	3	5	26th May, 1902			
		Return case R. W.	4	12	30th May, 1902			
601	B	Infecting case E.	1	7		24th June, 1902		Nil
		Return case C. S.	2	13	23rd July, 1902		29	
		Return case G. S.	3	11	25th July, 1902		31	

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Nil	Bedding, but not under mattress, disinfected. Clothes but not school jacket, disinfected. Infecting case ill 3 days in kitchen, before taken to hospital. Bed room disinfected	3 (ages 9, 6 and 4)	The mother of infecting case was confined 15th February. About 10th March (9 days before infecting case was discharged) she noticed she was peeling all over. She felt ill shortly after her confinement, but attributed it to "milk fever."
Sore throat	Satisfactory	1 (age 22)	Infecting case had sore throat after discharge, viz., from 8th to 13th September. Nails desquamating. September 12th, Mr. B., aged 45, had severe sore throat, delirium and high temperature and was in bed 8 days, diagnosis "quinsy." Never had a sore throat before. E. B., aged 13, had also a sore throat (not severe). Had scarlet fever four years previously.
Nil	Satisfactory. Dirty house	2 (ages 12 and 14)	J. C., aged 4, had headache and sore throat on 26th October. Desquamated in groins.
Nil	Clothing and bedding fumigated	3 (ages 2, 4, and 17)	
Nil	When infecting case was taken ill she was moved into parents' bed. This was the only room disinfected. Clothes fumigated and afterwards washed. Palliasse not disinfected	2 (ages 4 and 6)	The children attend school.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case. (Interval).	Infecting Case.
								Complications in Hospital.
255	C	Infecting case H. M.	1	3		30th Oct., 1901		Nil
		Return case A. M.	2	4	15th Dec., 1901		46	
276	B	Infecting case G. S.	1	3		23rd Nov., 1901		Adenitis
		Return case H. S.	2	30	14th Dec., 1901		21	
313	B	Infecting case R. T.	1	4		10th Dec., 1901		Otorrhœa
		Return case A. T.	2	6	6th Jan., 1902		27	
424	C	Infecting case L. G.	1	3		15th Feb., 1902		Nil
		Return case E. P.	2	4	7th March, 1902		20	
		Return case J. G.	3	8	10th March, 1902			
140	B	Infecting case A. K.	1	7		17th Sept., 1901		Nil
		Return case A K.	2	5	26th Oct., 1901		39	
226	B	Infecting case B. K.	1	4		28th Oct., 1901		Nil
		Return case R. K.	2	3	9th Dec., 1901		42	

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Nil	Dress worn first day of illness (Sunday) folded and put away until Dec. 8th. Seven days later return case was taken ill. The other clothes were washed at home	Nil	The children do not go out except with parents.
Nil	Bedding *not* disinfected. Clothing fumigated.	1 (age $^6/_{12}$)	
Fauces injected	Clothes and bedding fumigated	2 (ages 5 and 13)	
Nil	Clothing disinfected	Nil	
Nil	Room into which patient was moved into when rash was observed, disinfected. No wearing apparel disinfected	4 (ages 7, 5, 3 and $1\frac{1}{2}$)	The infecting case was at school the day before he was taken ill.
Nil	Satisfactory	2 (ages 8 and 7)	The children, once a week, have lunch at school. "They all drink milk out of the same cup."

In the following cases there were Long Intervals between the Return Cases.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	The Interval. After discharge of Infecting Case. 1st.	The Interval. Between 1st and 2nd Return Case. 2nd.	The Interval. Between 2nd and 3rd Return Case. 3rd.	Infecting Case. Complications in Hospital.
D	A	Infecting case B. C.	1	6½		12th Dec., 1902				Nil
		Return case A. C.	2	1½	19th Dec., 1902		7			
		Return case A. C.	3	8	1st Mar., 1903			72		
		Return case J. C.	4	9	3rd Mar., 1903				2	
62	A	Infecting case E. W.		14	2nd Feb., 1902	27th Mar., 1902				Nil
		Return case J. W.	1	19	29th Mar., 1902		2			
		Return case M. W.	2	7	2nd April, 1902		6			
		Return case R. W.	3	17	4th April, 1902		8			
		Return case B. W.	4	18/12	4th April, 1902		8			
		Return case A. W.	5	10	3rd May, 1902			29		
		Return case V. W.	6	4	5th May, 1902				2	
X	A	Infecting case G. S.	1	2	21st April, 1902	6th Aug. 1902				Otorrhœa and rhinorrhœa
		Return case W. F.	2	13	18th Aug., 1902		12			
		Return case A. S.	3	29	4th Oct. 1902			47		
		Return case A. F.	4	19	29th Dec., 1902				86	
119	A	Infecting case E. E.	1	10		11th Sept., 1901				Pneumonia and nephritis
		Return case A. E.	2	13	14th Sept., 1901		3			
		Return case G. E.	3	12	6th Oct., 1901			22		
215	A	Infecting case C. T.	1	9		3rd Dec., 1901				Otorrhœa and rhinorrhœa
		Return case J. T.	2	2	7th Dec., 1901		4			
		Return case F. T.	3	6	10th Dec., 1901			3		
		Return case A. T.	4	7	27th Dec., 1901				17	
221	A	Infecting case F. B.	1	5		2nd Dec., 1901				Otorrhœa and rhinorrhœa
		Return case A. B.	2	2	5th Dec., 1901		3			
		Return case E. B.	3	8	9th Jan., 1902			35		

Condition of Patients after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Rhinorrhœa, evening of discharge. At first purulent, later watery and intermittent	Was carried out with the utmost care and every precaution was taken to prevent another return case. The infecting case was sent to the seaside for a fortnight	Nil	The first return case was taken ill 7 days after infecting case was discharged and died of toxic scarlet fever. The day infecting case left hospital, return cases A. C., and J. C. were sent from home and were away 10 weeks. Eleven days after returning they contracted scarlet fever.
Desquamation on the feet. Septum nasi ? injected on the first occasion. Nil after discharge the second time	Satisfactory	Nil	When infecting case E. W. was discharged, she went direct to her home in the country, where there had been no cases of scarlet fever for several months. Two days later, she infected the first return case. On April 3rd, that is after infecting case had been home 7 days, she was re-admitted to the local hospital and was discharged again on the 26th. She was isolated for a week by herself, before discharge the second time. *Seven days later a fresh outbreak occurred in this house.* Her condition then appeared perfectly normal.
Otorrhœa and rhinorrhœa	Satisfactory	Nil	Infecting case G. S. was re-admitted to hospital on October 8th (four days after second return case was taken ill) on account of the mucous discharge from which he was still suffering. He was again discharged on December 20th. Nine days later his step brother, Case 4, was taken ill. That is to say *36 weeks after infecting case was first admitted to hospital.*
Sore throat	Satisfactory	Nil	The day after discharge from hospital "infecting case" had a sore throat, which lasted a week. About 2 weeks later peeling was observed.
Fauces morbid. Angle of mouth eczematous	Satisfactory	Nil	"Infecting case" slept with the 3rd return case A. T.
Tonsils enlarged. Glands (R) slightly enlarged	Satisfactory	Nil	E. B. (2nd return case) was at school day before she was taken ill. Her father, who is an undertaker, lately took measurements of a scarlet fever case. Overall not worn.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	The Interval.			Infecting Case.
							After discharge of Infecting Case.	Between 1st and 2nd Return Case.	Between 2nd and 3rd Return Case.	Complications in Hospital.
							1st.	2nd.	3rd.	
265	A	Infecting case T. J.	1	4	10th Sept., 1901	3rd Dec., 1901				Otorrhœa and rhinorrhœa
		Return case W. J.	2	8	11th Dec., 1901	6th Feb., 1902	8			
		Return case H. M.	3	$\frac{7}{12}$	27th Feb., 1902			78		
307	C	Infecting case H. R.	1	14		31st Dec., 1901				Eczema
		Return case T. R.	2	14	9th Jan., 1902		9			
		Return case M. R.	3	6	23rd Jan., 1902			14		
		Return case V. R.	4	4	23rd Jan., 1902				1	
318	C	Infecting case A. C.	1	9		18th Dec., 1901				Nil
		Return case A. C.	2	5	29th Dec., 1901		11			
		Return case J. C.	3	3	7th Jan., 1902			9		
413	A	Infecting case J. G.	1	4		15th Feb., 1902				Rhinorrhœa and nephritis
		Return case A. G.	2	6	18th Feb., 1902		3			
		Return case G. G.	3	8	5th Mar., 1902			15		
466	C	Infecting case C. T.	1	10		24th Mar., 1902				Nil
		Return case E. T.	2	5	26th Mar., 1902		2			
		Return case F. T,	3	9	18th April, 1902			23		
571	A	Infecting case E. R.	1	8		13th June, 1902				Nil
		Return case C. R.	2	$1\frac{5}{12}$	18th June, 1902		5			
		Return case J. R.	3	7	30th June, 1902			12		
573	A	Infecting case F. H.	1	3		19th June, 1902				Rhinorrhœa
		Return case J. H.	2	2	22nd June, 1902		3			
		Return case J. H.	3	5	1st July, 1902			9		

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Chronic severe rhinitis	Satisfactory	4 (ages 10, 16, 18 & 20)	The first return case W. J., who was taken ill after an "interval" of eight days, is a brother to T. J. The second return case H. M., aged $^7/_{12}$, is an infant living in the same house. Until a few days before the latter was taken ill, T. J. was not allowed to play with her. T. J. had severe rhinitis at the time the infant was taken ill. The first return case had been home from hospital 21 days, but rarely came in contact with the baby.
Rhinitis	Clothing fumigated. Old clothes not worn (*see Section X.*)	Nil	His nose was sore inside when he came home.
Sore throat	Clothing disinfected	1 (age $1^5/_{12}$)	Cough and sore throat the night he left hospital. Sore throat lasted 2 or 3 days.
Rhinorrhœa	Satisfactory	1 (age 1½)	Child had a discharge from the nose the day she came home. The discharge was present a month. Infecting case slept at first with his mother, afterwards with second return case.
Desquamating on the feet	The children were admitted to hospital desquamating. They were not confined to one room. Living room not disinfected	1 (age $^{11}/_{12}$)	Infecting case slept with return cases.
Impetigo, rhinitis and rhinorrhœa	Every-day clothes not disinfected	1 (age 3)	Sores on the buttocks, knee and foot, also rhinitis the day he came home. The following day "a lot of discharge."
Mucous membrane of nose morbid	Satisfactory	Nil	There was no rhinorrhœa after discharge from hospital, but the discharge had only ceased 2 days before the patient was sent out.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	The Interval			Infecting Case. Complications in Hospital.
							After discharge of Infecting Case.	Between 1st and 2nd Return Case.	Between 2nd and 3rd Return Case.	
							1st.	2nd.	3rd.	
277	C	Infecting case C. O.	1	37		25th Oct., 1901				Nil
		Return case R. O.	2	9	9th Nov., 1901		15			
		Return case E. O.	3	8	17th Nov., 1901			8		
		Return case S. O.	4	2	1st Dec., 1901				14	
501	A	Infecting case A. L.	1	3		3rd April, 1902				Rhinorrhœa
		Return case G. L.	2	7	6th April, 1902		3			
		Return case F. L.	3	$1^{6}/_{12}$	26th April, 1902			20		
508	C	Infecting case M. B.	1	5		28th Mar., 1902				Nephritis and otorrhœa
		Return case E. B.	2	3	3rd April, 1902		6			
		Return case M. B	3	19	16th April, 1902			13		
442	B	Infecting case K. G.	1	14		5th Feb., 1902				Nephritis, post-scarlatinal diphtheria
		Return case W. G.	2	23	12th Mar., 1902		35			
		Return case E. G.	3	16	12th April, 1902			31		
368	C	Infecting case E. O.	1	9		13th Jan., 1902				Otorrhœa and mastoid disease
		Return case J. O.	2	8	26th Jan., 1902		13			
		Return case G. O.	3	3	29th Jan., 1902			3		

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Sore throat	Satisfactory	4 (ages 12, 10, 6 & 5)	Infecting case had a bad sore throat some days after she came home.
Cold in the nose	Clothes not disinfected, but "smothered with carbolic"	Nil	Dirty cold house. All the children have nasal catarrh.
Slight otorrhœa	Satisfactory	Nil	Infecting case went from home the day after 1st return case was taken ill, and was absent 12 days when 2nd return case developed scarlet fever. ? *Did the 2nd return case get her infection from "infecting case" before she went to the country.*
Running from nose	Room into which patient was moved disinfected, bedding (but not sheets or blankets) disinfected. Clothes fumigated.	Nil	B. G. was nursed at home and was quarantined 5 weeks; a few days after discharge from quarantine her sister (K. G.) contracted scarlet fever. K. G. after discharge from hospital was the alleged infecting case.
Nil	Wearing apparel washed at home	3 (ages 15, 11 and 1)	The infecting case went down into the country for a fortnight, 3 days after she left hospital. Ten days later, 1st return case was taken ill. ? *Was this case infected before primary case went from home.*

IV.

Series of Cases occurring in the same house at intervals after the Primary Outbreak.

Series of Cases occurring in the same house at intervals after the primary outbreak.

No. of Case.		Serial No.	Ages.	Date of Onset.	Interval (after previous case.)	Date of Discharge.	Return Case (interval.)
259 C		1	3	28th Sept., '01		12th Nov., '01	
	Infecting case F. R.	2	1	22nd Oct., '01	24	12th Dec., '01	
	Return case T. C.	3	26	20th Dec., '01	59		8
550 B	Infecting case E. M.	1	33	26th Mar., '02		14th May, '02	
	Return case H. S.	2	3	17th May, '02	52	Unrecognised case	3
	Return case C. S.	3	6	19th May, '02	2		
	Return case W. S.	4	14	27th May, '02	8		
	Return case A. S.	5	30	30th May, '02	3		
	Return case F. S.	6	7	14th June, '02	15		
421 B	Infecting case M. S.	1	10	13th Jan., '02		27th Feb., '02	
	D. S.	2	16	15th Jan., '02	2	Unrecognised case	
	S. S.	3	7	30th Jan., '02	15		
	R. S.	4	5	12th Feb., '02	13		
	Return case W. S.	5	15	4th Mar., '02	20		5
328 B	Infecting case C. D.	1	11	5th Nov., '01		23rd Dec., '01	
	L. D.	2	7	18th Dec., '01	43		
	Return case T. D.	3	2	29th Dec., '01	11		6
393 C	G. B.	1	3	11th Dec., '01		15th Feb., '02	
	Infecting case S. C.	2	5	22nd Dec., '01	11	8th Feb., '02	
	A. B.	3	$^4/_{12}$	7th Jan., '02	16		
	Return case A. C.	4	$1\,^1/_{12}$	16th Feb., '02	40		8
172 C	D. K.	1	12	25th July, '01		20th Sept., '01	
	Infecting case H. K.	2	6	18th Sept., '01	55	1st Nov., '01	
	Return case D. K.	3	10	19th Nov., '01	62		18
257 C	R. E.	1	7	22nd Oct., '01		18th Dec., '01	
	Infecting case S. P.	2	23	23rd Oct., '01	1	14th Dec., '01	
	F. E.	3	11	5th Dec., '01	43		
	Return case K. E.	4	6	18th Dec., '01	13		4

Infecting Case.	Disinfection.	Susceptible Children.	Remarks.
Complications in hospital.			
Rhinorrhœa	Clothes fumigated and washed at home	Nil	Cases 2 and 3 were taken ill at intervals of 24 and 59 days, respectively. Case 2 while Case 1 was still in hospital, and Case 3 eight days after Case 2 was discharged.
Nil	*See Section X.*	1 (age 4)	The alleged infecting case lives in the same house, but did *not* come in contact with Cases 2 and 3 either before or after they were taken ill. The origin of the outbreak in the family of the return cases was Case 2, which was unrecognised. He was peeling on the day of my visit. All the susceptible children except one contracted scarlet fever, and the child who escaped suffered from rhinorrhœa of recent date, but there was no history of sore throat or any other illness.
Nil	As each child became ill they were moved into the mother's room. The room last occupied was disinfected	1 (age 1)	Case 2 was desquamating and going about the house. She had a rash on the chest, headache, sore throat, &c. She was not certified.
Nil	Room occupied after the illness began disinfected. Clothes washed at home	1 (age 4)	Condition after discharge, patient had sore throat at times. Cases 2 and 3 were taken ill at intervals of 43 and 11 days respectively. Case 2 while Case 1 was still in hospital, and Case 3 six days after Case 2 was discharged.
	Clothes fumigated	4 (ages 7, 4, 5 and 3)	The infecting case had stomatitis, nasal catarrh and otorrhœa after discharge. Cases 2, 3 and 4 were taken ill at intervals of 11, 16 and 40 days. Cases 2 and 3 while Case 1 was still in hospital, and Case 4 eight days after Case 2 was discharged.
Nil	Clothes fumigated. Not washed. Worn on discharge from hospital	1 (age 4)	The infecting case had a slight cold about the same time as return case was taken ill. Case 2 was admitted to hospital the day before Case 1 was discharged.
Nil	Satisfactory	Nil	Infecting case had a cough when discharged. Cases 2, 3 and 4 were taken ill at intervals of 1, 43 and 13 days. Cases 2 and 3 while Case 1 was still in hospital, and Case 4 four days after Case 2 was discharged.

No. of Case.		Serial No.	Ages.	Date of Onset.	Interval (after previous case).	Date of Discharge.	Return Case (interval).
	H. W.	1	6	4th Oct., '01		2nd May, '02	
396	Infecting case E. W.	2	10	4th Dec., '01	61	22nd Jan., '02	
520 C	Infecting case M. W.	3	8	12th Feb., '02	70	23rd April, '02	21
	Return case H. W.	4	3	1st May, '02	78		8
407 C	Infecting case C. C.	1	8	1st Nov., '01		6th Dec., '01	
	Baby	2	$^6/_{12}$	6th Nov., '01	5	Unrecognised case	
	F. C.	3	9	20th Nov., '01	14	Ditto	
	E. C.	4	3	12th Dec., '01	22	27th Jan., '02	6
408 C	Infecting case L. C.	5	5	12th Dec., '01			
	Return case A. C.	6	7	17th Feb., '02	67		21
	L. H.	1	5	22nd Nov., '01		Still in hospital	
	J. H.	2	6	3rd Dec., '01	11	10th Feb., '02	
	R. H.	3	8	14th Dec., '01	11	20th Jan., '02	
417 A	Infecting case A. H.	4	2	24th Dec., '01	10	26th Feb., '02	
	Return case A. L.	5	4	28th Feb., '02	66		2
481 C	E. T.	1	4	29th Dec., '01		15th Mar., '02	
	H. T.	2	2	16th Jan., '02	18	15th Mar., '02	
	Infecting case P. T.	3	$^9/_{12}$	10th Feb., '02	25	29th Mar., '02	
	Return case F. T.	4	6	3rd April, '02	52		5
491 C	Infecting case L. A.	1	13	5th Jan., '02		1st Mar., 1902	
	M. A.	2	7	14th Feb., '02	40		
	Return case H. A.	3	5	15th April, '02	60		46
498 C	Infecting case M. R.	1	3	24th Dec., '01		10th Mar., '02	
	W. R.	2	4	1st Jan., '02	8	16th April, '02	
	Return case G. R.	3	8	16th April, '02	105		37

Infecting Case. Complications (in hospital.)	Disinfection.	Susceptible Children.	Remarks.
Endocarditis	Clothes washed at home Ditto	2 (ages 12 and 1)	Infecting case (No. 3) had a slight cold after discharge from hospital. Cases 2, 3 and 4 were taken ill after intervals of 61, 70 and 78 days respectively. Case 1 was, still in hospital when Case 2 was taken ill. Case 2 had been home 21 days before Case 3 was taken ill, and Case 3 eight days before Case 4's illness began.
Nil	Clothes washed at home *See Section X.*	Nil Nil	Infecting case No. 1 was desquamating after discharge from hospital. Infecting case No. 5 had rhinitis after discharge from hospital. Cases 2 and 3 had definite symptoms of scarlet fever, including desquamation. Case 3 was desquamating and attending school when I examined him. Cases 4 and 5 were taken ill 22 days after Case 3, or 6 days after Case 1 was discharged. Case 6 was taken ill 67 days after Case 5, or 21 days after Case 5 was discharged.
Rhinorrhœa	Wearing apparel washed at home	3 (ages 4, 1 and 8)	Infecting case had slight catarrh after discharge from hospital. Return case, rash was out the first day she was known to be ill, or only 2 days after infecting case was discharged.
Nil	Clothes disinfected. Dirty house	1 (age 9)	Infecting case had excoriations and fissure ani after discharge from hospital. Cases 2, 3 and 4 occurred at intervals of 18, 25 and 52 days, respectively. Cases 2 and 3 while Case 1 was still in hospital, and Case 4 five days after Case 3 was discharged.
Rhinitis	Satisfactory	4 (ages 16, 17, 3 and 2).	Cases 2 and 3 were taken ill after intervals of 40 and 60 days respectively. Case 2 while Case 1 was still in hospital, and Case 3, 46 days after Case 1 was discharged. The alleged infecting case was suffering from rhinitis when Case 3 (the return case) was taken ill.
Nephritis, varicella, otorrhœa and rhinorrhœa	Bedroom not disinfected as the children were running about when the rash was first seen.	4 (ages 11, 10, 7 and 1)	Infecting case had rhinorrhœa in hospital, and chronic rhinitis and rhinorrhœa since returning home. Cases 2 & 3 were taken ill after intervals of 8 and 105 days, respectively. Case 3 was taken was ill the day Case 2 returned from hospital, and not until 37 days after Case 1 was discharged.

No. of Case.		Serial No.	Ages.	Date of Onset.	Interval (after previous cases)	Date of Discharge.	Return Case (interval.)
533 C	Infecting case R. K.	1	$1\frac{2}{12}$	23rd Feb., '02		27th Mar., '02	
	W. K.	2	3	28th Feb., '02	5	27th Mar., '02	
	F. K.	3	4	11th Mar., '02	11	In hospital	
	Return cases G. K.	4	7	20th April, '02	40	”	24
	P. K.	5	5	25th April, '02	5		
542 B	Infecting case D. K.	1	3	4th March, '02		28th April, '02	
	M. K. & B. K.	2 &3	19, 12	15th April, '02	42	In hospital	
	F. K. & B. K.	4 & 5	17, 7	24th April, '02	9	”	
	Return case A. K.	6	15	7th May, '02	13		9
605 B	Infecting case G. B.	1	26	24th April, '02		3rd July, 1902	
	G. H.	2	4	2nd June, '02	39	In hospital	
	G. H.	3	3	10th June, '02	8	”	
	Mrs. H.	4	31	18th June, '02	8	”	
	Return case G. N.	5		22nd July, '02	34		19
319 B	A. P.	1	8	3rd Oct., '01		Treated at home	
	G. P.	2	9	4th Oct., '01		Treated at home	
	Infecting case W. P.	3	16	16th Nov., '01	43	4th Jan., '02	
	Return case A. P.	4	10	21st Jan., '02	66		17
		1	16	26th June, '02		Treated at home	
		2	8	16th July, '02	20	12th Sept.	
	Infecting case	3	12	5th Aug., '01	20	5th November	
		4	5	13th Aug., '01	8	12th Sept.	
	Return case	5	$1\frac{4}{12}$	10th Nov., '02	89		5
142 B	Infecting case W. D.	1	8	12th Sept., '01		4th November	
	T. D.	2	3	22nd Sept., '01	10	Still in hospital	
	Return case E. D.	3	13	2nd Nov., '01	41		—2
62 B	B. D.	1	8	18th Dec., '01		19th Feb., '02	
	F. D.	2	17	5th Feb., '02	49	12th April, '02	
	N. D.	3	15	11th April, '02	65		

Infecting Case.	Disinfection.	Susceptible Children.	Remarks.
Complications in hospital.			
Nil	When the children took ill they were moved into another room, the last room occupied was disinfected. Dirty, untidy premises.	1 (age 5)	Otorrhœa began two days after the patient was home and the skin about the ear became eczematous. The glands were swollen on discharge. Case 4 was taken ill 24 days after Case 1 was discharged or 40 days after Case 3 was taken ill.
Nil	Clothes fumigated on each occasion, and clothes washed	Nil	Cases 2, 3, 4 and 5 occurred whilst Case 1 was in hospital. Case 6 occurred 13 days after 4 and 5, and 9 days after Case 1 was discharged.
Nil	The house was thoroughly disinfected	1 (age $^{4}/_{12}$)	Cases occurred in this house at intervals of 39, 8, 8 and 34 days. Cases 2, 3 and 4 were taken ill while Case 1 was in hospital. Case 5 came up from the country on a visit to this house, and was taken ill 3 days later. The source of infection was, I believe, an infant $^{4}/_{12}$ who had a "swollen neck."
Nil	Room occupied by the home treated cases, fumigated. A quantity of books, papers and rubbish in this room.	2 (ages 9 and 4)	The infecting case had a catarrh on discharge from hospital. Case 3 occurred 43 days after Cases 1 and 2. Cases 1 and 2 were not out of quarantine when Case 3 was taken ill.
Sore nose and nephritis.	Satisfactory.	1 (age 15)	Cases 2, 3, 4 and 5, occurred at intervals of 20, 20, 8 and 89 days, respectively. Case 1 was treated at home but the remaining cases were removed to hospital immediately after their illness commenced. During the time Case 1 was desquamating she nursed Case 5.
Enlarged tonsils	*See Section X.*		Cases occurred in this house at intervals of 10 and 41 days. The last case was taken ill 2 days before the first case was discharged. The rash was out on the morning Case 1 returned home.
Nil	Ditto		Cases occurred in this house at intervals of 49 and 65 days respectively. Case 2 was taken ill 14 days before Case 1 was discharged, and Case 3 the day before Case 2 left hospital.

V.

Cases in which the period of Invasion was protracted or in which there was a latent interval after the reception of infection.

Cases in which the invasion period was protracted or there was a latent

No. of Case.	Classification.		Serial No.	Age.	Date of Rash.	Date of Discharge.	Return Case (Interval). *	Infecting Case.
								Complications in Hospital.
240	B	Infecting case L. B.	1	3½		23rd Dec., 1901	5	Otorrhœa
		Return case A. B.	2	6	28th Dec. 1901			
313	B	Infecting case R. T.	1	4		10th Dec., 1901	27	Otorrhœa, chronic enlarged tonsils
		Return case A. T.	2	6	6th Jan., 1902			
315	C	Infecting case E. L.	1			4th Jan., 1902	8	Rhinorrhœa
		Return case L. L.	2	11	12th Jan., 1902		11	
		Return case G. L.	3	7	15th Jan., 1902			
27	C	Infecting case A. T.	1	4		22nd July, 1901	8	Double otorrhœa, rhinorrhœa
		Return case D. T.	2	6	30th July, 1901			
65	B	Infecting case G. F.	1	13		30th Aug., 1901	—	Nil
		Return case F. F.	2	5	30th Aug., 1901			
150	C	Infecting case F. B.	1	6		2nd Nov., 1901	7	
		Return case C. B.	2	2	9th Nov., 1901			
203	C	Infecting case K. B.	1	10		6th Nov., 1901	13	
		Return case M. B.	2	16	19th Nov., 1901			
		Return case L. B.	3	9	21st Nov., 1901			
		Return case E. B.	4	2	2nd Dec., 1901			

interval after the reception of the infection.

Condition of Patient after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Fauces injected, tonsils morbid	Satisfactory	Nil	On 23rd December the mother of the return case had a severe sore throat and was ill for a week or 10 days. On 24th December the return case had a fit. On the 24th to 27th malaise and on the 28th rash.
Throat injected (chronic)	Room sulphured	2 (ages 13 and 5)	On 6th January the rash appeared, but no other definite symptoms of scarlet fever before that date. Since infecting case has been home, return case suffered from sore throat off and on and a feeling of malaise.
Fauces morbid. Nose blocked with dried secretion	Clothing "not taken away," mother washed some of them, trousers not washed but worn before illness and on day of discharge and since	3 (ages 13, 1 $^{9}/_{12}$ and $^{4}/_{12}$)	(1) L. L. Onset of illness 11th January, rash appeared 12th January. (2) G. L. on the 10th January, had headache and sore throat, was ill two days and apparently recovered until on 15th January when the rash appeared.
Nasal discharge, nares very red and tender and excoriated. Palate and fauces good deal injected, enlarged glands	1 bed room fumigated, bedding and clothes taken away	1 (age 1½)	On 22nd July return case was very sick and his glands were swollen. He stayed at home and apparently recovered. 27th July his illness returned and he vomited several times; 28th and 29th July, he was drowsy; 30th July, the rash appeared. A child in the same tenement was removed to hospital on the 26th, suffering from scarlet fever.
Nil	Toys not disinfected	Nil	On the 16th August, Mrs. F. (mother of return case) had a severe sore throat, was ill 3 weeks and "left her very weak." 19th August, return case had sore throat and was in bed a few days. 29th. his sore throat returned and other symptoms of scarlet fever. 30th, rash present in the morning. *The infecting case was discharged the same afternoon.*
Enlarged glands	Bed, bedding, and clothes disinfected	1 (aged 5)	On 30th October, the return case had a headache and sore throat. 30th October to 8th November, felt ill and had no appetite. 9th November, rash appeared.
Enlarged tonsils	Clothes fumigated, bedding disinfected	4 (ages 21, 18, 14 and $^{9}/_{12}$)	On 10th November, return case M. B. had headache, sore throat, malaise, felt ill. Symptoms continued until the rash appeared. 19th November, rash present. Two more return cases followed, one on the 21st November, and the other on 1st December.

No. of Case.	Classification.	.	Serial No.	Age.	Date of Rash.	Date of Discharge.	Return Case (Interval). *	Infecting Case.
								Complications in Hospital.
570	B	Infecting case E. P.	1	6		18th June, 1902		Nil
		Return case O. M.	2	4	22nd June, 1902		4	
577	B	Infecting case E. W.	1	9		26th May, 1902		Nil
		Return case M. W.	2	8	19th June, 1902		24	
		Return case L. W.	3	14	22nd June, 1902		27	
510	C	Infecting case P. H.	1	6		23rd April, 1902		Nephritis, sup. adenitis
		Return case F. H.	2	3	27th April, 1902		4	
519	A	Infecting case L. S.	1	14		18th April, 1902		Tonsillitis and enlarged glands
		Return case E. S.	2	20	3rd May, 1902		15	
534	B	Infecting case S. W.	1	4		19th March, 1902		Nil
		Return case D. W.	2	7	9th May, 1902		51	
547	C	Infecting case V. F.	1	3		12th March, 1902		Enlarged tonsils
		Return case F. F.	2	13	28th March, 1902		16	

Condition of Patient after discharge.	Disinfection.	Susceptible Children.	Remarks.
Nil	Satisfactory	4 (ages 5, $1^{5}/_{12}$, $1^{8}/_{12}$, and $^{8}/_{12}$)	The day infecting case came back, return case was feeling ill, she had malaise and loss of appetite and was drowsy. The malaise continued up to the time the rash came out. The return case was not confined to bed before admission to hospital on the 24th June.
Nil	Dress fumigated, worn on return from hospital	1 (age 11)	About 3 weeks before infecting case was discharged (5th May), return case, L.W., was in bed with a "bad, ulcerated throat." About the same time after infecting case was discharged, return case had another sore throat, which lasted a week before the rash came out.
Otorrhœa	Astrachan overcoat not disinfected, number of toys in the kitchen not disinfected, toys used in bed room fumigated	1 (age $1^{7}/_{12}$)	Return case was ill a fortnight before the rash appeared. She was under treatment for tonsillitis.
Adenoids. Nose blocked, some catarrh	Return case; dress not disinfected or washed, bedding not taken away, as on the first occasion they were much damaged	3 (ages 24, 23, and 20)	On April 27th, return case was in bed with sore throat. May 3rd rash appeared.
Swollen glands, 10 days after he returned home	Primary case; dresses and clothing in the room exposed to fumigation, contents of cot, but not mother's bed, disinfected	Nil	Two days before infecting case came home, return case was laid with an "ulcerated sore throat." His illness lasted about 3 weeks. He apparently recovered, but 4 weeks later, he had another bad throat. On this occasion the rash was present. He was dangerously ill on admission.
Fauces morbid, slight catarrh.	Primary case; kitchen disinfected, bed brought into kitchen to save going up and down stairs. Return case moved into mother's room which was the only room disinfected	2 (ages 15 and 10)	On March 22nd, return case had headache and sore throat. March 28th, rash was first present. The sister of return case was taken ill the same day (March 22nd). She had headache, vomiting, sore throat, and was certified to be suffering from diphtheria. The case was diagnosed tonsillitis in hospital.

No. of Case.	Classification.		Serial No.	Age.	Date of Rash.	Date of Discharge.	Return Case (Interval). *	Infecting Case. Complications in Hospital.
374	C	Infecting case A. S.	1	7		1st Feb., 1902		Adenitis
		Return case E. S.	2	4	5th Feb., 1902		4	
400	C	Infecting case C. S.	1	4		5th Feb., 1902		Otorrhœa
		Return case J. S.	2	2	13th Feb., 1902		8	
460	C	Infecting case E. S.	1	6		19th Mar., 1902		Nil
		Return case A. S.	2	4	24th Mar., 1902		5	
489	A	Infecting case H.C.	1	3		7th Mar., 1902		Otorrhœa
		Return case A.C.	2	5	22nd Mar., 1902		15	
335	A	Infecting case V. C.	1	5		1st Jan., 1902		Nil. No clinical signs of diphtheria in hospital. Culture not taken.
		Return case E. C.	2	9				
		Return case F. C.	3	7				
358	C	Infecting case A. H.	1	4		17th Jan., 1902		Rhinorrhœa
		Return case M. H.	2	9	19th Jan., 1902		2	
370	A	Infecting case J. L.	1	6		23rd Jan., 1902		Nil
		Return case B. L.	2	4	8th Feb., 1902		16	

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* As the onset of the illness of the "return case" was uncertain, in the following cases the "interval" is calculated

Condition of Patient after discharge.	Disinfection.	Susceptible Children.	Remarks.
Nil	Satisfactory	1 (age 7)	Had vomiting and diarrhœa for 2 days before infecting case was discharged. Apparently recovered, until 5th February, when the rash was suddenly observed. The return case was then feeling quite well.
Nose, slight catarrh, glands palp:	Taken into mother's room when his illness began; mother's room disinfected	2 (ages 10 and 13)	A week previous to the rash return case had malaise and was drowsy also nasal catarrh. He apparently recovered, until 13th February, when the rash was observed.
Yellow muco-pus in left nostril. Fauces injected	Coat belonging to primary case, fumigated	1 (age 5)	On 17th March, (2 days before infecting case was discharged) return case had headache and was drowsy. Neck swollen and tender. No appetite. 24th March, rash came out.
Otorrhœa	Primary case, bed room fumigated chair bed disinfected mother's bed not, living room not disinfected, clothes washed at home	1 (age 1)	On 16th March, return case very drowsy. 17th and 18th, malaise and loss of appetite. He was kept at home from school. On the 22nd rash appeared. He was then feeling quite well.
Diph. bacilli. Nearly pure culture in the throat	Satisfactory	Nil	When V. C. was taken ill with *scarlet fever*, Mrs. C. was in bed with a fractured leg. V. C. was put into her mother's bed until removal to hospital. Nineteen days later Mrs. C., who was still in bed, developed *diphtheria*. The subsequent events suggest that V. C., before admission to hospital on 15th November, infected her mother, for on the return from hospital V. C. (in whose throat an almost pure culture of diphtheria bacilli was found) infected the return cases, one with diphtheria and the other with diphtheria and scarlet fever.
Nose, slight excoriation and catarrh, glands palp	When she was taken ill, she was moved into mother's room which was fumigated. Sheets not taken away, but washed at home	1 (age 8)	The return case was feeling ill for a week before the rash came out. She had headache, sore throat and anorexia.
Nil	Clothes disinfected, overcoat fumigated	Nil	On 25th, 26th and 27th return case was ill and attended the doctor's surgery. He apparently recovered until 8th February, when the rash was observed.

from the date of discharge of the alleged "infecting case" to the appearance of the rash.

VI.

Infection continued after Rhinorrhœa had ceased.

Infection continued after Rhinorrhœa had ceased.

No. of Case.	Primary Case. Name and Age.		Date of Discharge.	No. of days in hospital.	Complications in Hospital.	Condition after Discharge.	Classification.
221	F. B.	Age 5	2nd Dec., 1901	60	Rhinorrhœa, otorrhœa	Tonsils enlarged. Glands enlarged	A
144	A. H.	Age $1^{3}/_{12}$	30th Oct., 1901	49	Rhinorrhœa, otorrhœa	Nasal catarrh (slight)	A
259	F. R.	Age 1	12th Dec., 1901	51	Rhinorrhœa	Tonsils morbid	A
366	W. L.	Age 4	15th Jan., 1902	60	Rhinorrhœa	Nil	A
254	H. C.	Age $1^{10}/_{12}$	12th Dec., 1901	90	Rhinorrhœa	Slight catarrh for a day or two after discharge	A
101	D. D.	Age 6	12th Sept., 1901	57	Rhinorrhœa	Tonsils enlarged. Nose injected. Measles 9 days after discharge	A
215	C. T.	Age 9	3rd Dec., 1901	73	Rhinorrhœa	Fauces morbid	A
289	C. C.	Age 10	21st Dec., 1901	61	Rhinorrhœa	Eczema, rhinitis	A
371	R. S.	Age 8	6th Feb., 1902	63	Rhinorrhœa	Slight nasal catarrh	A
316	R. H.	Age 6	13th Jan., 1902	76	Rhinorrhœa	Sore in the nose	A
555	D. R.	Age 2	16th May, 1902	123	Rhinorrhœa	Very slight catarrh	A
188	G. S.	Age 6	15th Nov., 1901	60	Rhinorrhœa	Glands enlarged; skin of heels rough	A
483	C. G.	Age 2	27th Mar., 1902	44	Rhinorrhœa	Rhinitis; sore nose 2 or 3 days after discharge	A
472	W. P.	Age 4	17th Mar., 1902	44	Rhinorrhœa	Eczema of ear and fissure	A
417	A. H.	Age 2	26th Feb., 1902	64	Rhinorrhœa	Nose still catarrh	A
180	J. I.	Age 3	14th Nov., 1901	63	Rhinorrhœa	Cold on chest	C
573	F. H.	Age 3	19th June, 1902	64	Rhinorrhœa	Nose not healthy	A

Return Case. Name, Age, and Onset of Illness.	Interval.	Remarks.
A. B. Age 2 Onset 5th December	3	Rhinorrhœa and otorrhœa ceased 3 days before discharge.
F. H. Age 9 Onset 8th November	9	Rhinorrhœa and otorrhœa ceased 3 days before discharge.
F. C. Age 26 Onset 20th December	8	Rhinorrhœa ceased 5 days before discharge.
A. L. Age 2 Onset 25th January	10	Rhinorrhœa ceased 9 days before discharge.
M. C. Age 3 Onset 15th December	3	Rhinorrhœa ceased 13 days before discharge.
F. D. Age 3 Onset 1st October	19	Rhinorrhœa ceased 4 days before discharge. Developed measles 9 days after discharge.
G. D. Age 4 Onset 1st October	19	
J. T. Age 2 Onset 7th December	4	Had rhinorrhœa 1 day only (November 19th), 15 days before discharge.
L. C. Age 2 Onset 25th December	4	Had rhinorrhœa for 10 days, ceased November 1st.
F. S. Age 6 Onset 9th February	3	Rhinorrhœa ceased 6 days before discharge.
D. S. Age 10 Onset 9th February	3	
L. H. Age 4 Onset 19th January	6	Rhinorrhœa ceased 1 month before discharge.
T. R. Age 4 Onset 23rd May	7	Rhinorrhœa ceased 3 days before discharge.
W. S. Age 8 Onset 20th November	5	Rhinorrhœa ceased 17th October, 39 days before discharge.
J. G. Age 5 Onset 6th April	10	Rhinorrhœa ceased 11 days before discharge.
E. P. Age 8 Onset 21st March	4	Rhinorrhœa ceased 32 days before discharge.
A. L. Age 4 Onset 28th February	2	Rhinorrhœa ceased 5 days before discharge.
A. I. Age $1^{3}/_{12}$ Onset 19th November	5	Rhinorrhœa ceased 6 days before discharge.
J. H. Age 2 Onset 22nd June	3	Rhinorrhœa ceased 2 days before discharge.

VII.

Cases in which there was no morbid condition after discharge
and
Cases in which the morbid condition after discharge was trivial.

No morbid condition after Discharge.

	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case (Interval).	Infecting Case. Complications in Hospital.
A	A	Infecting case C. K.	1	5		10th Dec., 1902		Rhinorrhœa
		Return case A. K.	2	3	16th Dec., 1902		6	
B	C	Infecting case S. S.	1	5		13th Oct., 1902		Tonsillitis and measles
		Return case K. N.	2	6	31st Oct., 1902		18	
C	A	Infecting case K. C.	1	7		20th Oct., 1902	10	Nil
		Return case M. C.	2	5	30th Oct., 1902			
D	C	Infecting case S. C.	1	7		15th Nov., 1902		Varicella
		Return case H. C.	2	11	22nd Nov., 1902		7	
E	A	Infecting case R. B.	1	12		5th Nov., 1902		Nephritis and sore nose
		Return case O. B.	2	$1^4/_{12}$	10th Nov., 1902		5	
F	A	Infecting case G. T.	1	1		29th Nov., 1902		Nil
		Return case F. T.	2	3	2nd Dec., 1902		3	
225	A	Infecting case H. F.	1	6		28th Nov., 1901		Otorrhœa and nephritis
		Return case J. F.	2	5	5th Dec., 1901		7	
290	A	Infecting case W. B.	1	4		3rd Jan., 1902		Tonsillitis
		Return case C. B.	2	6	9th Jan., 1902		6	
366	A	Infecting case W. L.	1	4		15th Jan., 1902		Rhinorrhœa
		Return case A. L.	2	2	25th Jan., 1902		10	
17	C	Infecting case D. K.	1	4		10th May, 1901		Diphtheria, and rhinorrhœa otorrhœa
		Return case C. K.	2	7	14th May, 1901		4	

Condition of Patient after Discharge.	No. of days in Hospital.	Susceptible Children.	Remarks.
Nil	72	Nil	Rhinorrhœa ceased 3 days before discharge.
Nil	84	3 (ages 1, 2 and 4)	Tonsillitis ceased 14 days before discharge. Measles ceased 47 days before discharge.
Nil	43	3 (ages 4, 12 and 14)	K. C. was isolated at home 5 days after discharge.
Nil	66	1 (age 14)	House well disinfected.
Nil	92	1 (age 15)	Had sore nose for 14 days while in bed. Quite free on discharge.
Nil	58	Nil	Admitted for diphtheria. Contracted scarlet fever and was discharged 28 days after she contracted same.
Nil	73	2 (ages 12 and $1^5/_{12}$)	Otorrhœa commenced 29 days after admission and nephritis 3 days later.
Nil	52	1 (age 1)	Tonsillitis came on 22 days before discharge.
Nil	60	Nil	Rhinorrhœa ceased 9 days before discharge.
Nil	138	3 (ages 12, 2 and $^2/_{12}$)	Contracted diphtheria 99 days after admission. Rhinorrhœa ceased 12 days before diphtheria began. Had otorrhœa for 9 days.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case (Interval).	Infecting Case. Complications in Hospital.
381	A	Infecting case T. G.	1	6		5th Feb., 1902		Rhinorrhœa
		Return case C. G.	2	2	11th Feb., 1902		6	
609	A	Infecting case G. L.	1	5		15th July, 1902		Adenitis
		Return case H. C.	2	5	21st July, 1902		6	
622	A	Infecting case H. A.	1	6		17th July, 1902		Nil
		Return case J. A.	2	3	31st July, 1902		14	
549	A	Infecting case M. C.	1	10		15th April, 1902		Nil
		Return case T. W.	2	5	27th April, 1902		12	
		A. C.	4	14	28th April, 1902		13	
		E. W.	3	30				
335	A	Infecting case V. C.	1	5		1st Jan., 1902		Nil
		Return case E. C.	2	9	8th Jan., 1902		7	
		F. C.	3	7	11th Jan., 1902		10	
11	A	Infecting case C. B.	1	8		20th June, 1902		Nil
		Return case R. B.	2	5	22nd Jan., 1902		2	

Morbid condition after Discharge trivial.

221	A	Infecting case F. B.	1	5	-	2nd Dec., 1901		Rhinorrhœa and otorrhœa
		Return case A. B.	2	2	5th Dec., 1901		3	
		B. B.	3	8	9th Jan., 1902			
144	A	Infecting case A. H.	1	$1\frac{3}{12}$		30th Oct., 1901		Rhinorrhœa and otorrhœa
		Return case J. H.	2	9	8th Nov., 1901		9	
259	A	Infecting case F. R.	1	1		12th Dec., 1901		Rhinorrhœa
		Return case F. C.	2	26	20th Dec., 1901		8	

Condition of Patient after Discharge.	No. of days in Hospital.	Susceptible Children.	Remarks.
Nil	56	3 (ages 9, 5 and 1)	Parents state "infecting case" was quite well on discharge.
Nil	57	2 (ages 3 and $\frac{10}{12}$)	Adenitis during convalescence.
Nil	54	1 (age 10)	
Nil	67	3 (ages 18, 4 and $\frac{9}{12}$)	Diphtheria bacilli found in the throat after discharge. Return cases (1) and (2) suffered from scarlet fever, (3) from diphtheria.
Nil	47	4 (ages 18, 17, 16 and 11)	Diphtheria bacilli found in the throat after discharge. Return case (1), suffered from scarlet fever (2), from scarlet fever and diphtheria.
Nil	55	1 (age 6 months)	Complained of sore nose after discharge. No rhinorrhœa.

Glands (R) palp: enlarged tonsils	60	2 (ages 6 and $\frac{4}{12}$)	Rhinorrhœa and otorrhœa ceased 3 days before discharge.
Slight nasal catarrh	49	Nil	Rhinorrhœa and otorrhœa ceased 3 days before discharge.
Tonsils morbid	51	1 (age 3)	Rhinorrhœa ceased 5 days before discharge.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case (Interval).	Infecting Case.
								Complications in Hospital.
535	A	Infecting case A. F.	1	4		8th May, 1902		Nephritis and endocarditis
		Return case M. F.	2	2	15th May., 1902		7	
159	A	Infecting case T. W.	1	9		26th Oct., 1901		Rhinorrhœa
		Return case E. W.	2	$2\frac{4}{12}$	30th Oct., 1901		4	
252	A	Infecting case S. F.	1	5		12th Dec., 1901		Nephritis
		Return case W. F.	2	3	16th Dec., 1901		4	
43	A	Infecting case A. M.	1	$3\frac{1}{2}$		3rd August, 1901		Rhinorrhœa, relapse scarlet fever
		Return case E. M.	2	$2\frac{11}{12}$	10th Aug., 1901		7	
64	A	Infecting case F. M.	1	6		20th Aug., 1901		Nil
		Return case F. M.	2	39	26th Aug., 1901		6	
73	A	Infecting case E. W.	1	6		9th Aug., 1901		Cervical abscess, albuminuria, and otorrhœa
		Return case H. W.	2	$2\frac{1}{2}$	15th Aug., 1901		6	
		W. S.	3	5				
		A. S.	4	6	19th Aug.			
		C. W.	5	7	3rd Sept.			
125	C	Infecting case P. M.	1	7		18th Oct., 1901		Rhinorrhœa
		Return case W. M.	2	10	22nd Oct., 1901		4	
128	A	Infecting case N. M.	1	6		27th Sept., 1901		Nil
		Return case M. M.	2	29	14th Oct., 1901		17	
133	C	Infecting case D. B.	1	4		24th Oct., 1901		Nil
		Return case W. B.	2	27	29th Oct., 1901		5	
146	A	Infecting case E. M.	1	6		5th Nov., 1901		Nil
		Return case H. M.	2	7	7th Nov., 1901		2	
152	A	Infecting case E. C.	1	9		19th Oct., 1901		Seborrhœa
		Return case H. C.	2	$2\frac{1}{2}$	1st Nov., 1901		13	

Condition of Patient after Discharge.	No. of days in Hospital.	Susceptible Children.	Remarks.
Fauces morbid	72	5 (ages 16, 13, 3, 1 and $\frac{1}{2}$)	Right tonsil enlarged and red after discharge.
Fauces morbid	43	Nil	Mrs. W. had a severe sore throat the day "return case" was taken ill.
Seborrhœa	79	3 (ages 6, 4 and 1)	House clean and had been thoroughly disinfected.
Fissure behind the ear	60	2 (ages 3 and $\frac{11}{12}$)	Had a relapse of scarlet fever 37 days before discharge.
Fauces injected	56	4 (ages 12, 7, 5 and 1)	Complained of some irritation in the throat.
Enlarged glands	73	2 (ages $\frac{6}{12}$ and $\frac{9}{12}$)	Glands became swollen a few days after discharge Return cases W. S. and H. W., suffered from scarlet fever and diphtheria; A. S. and C. W. from scarlet fever.
Nose — slight abrasion of skin and mucous membrane	51	Nil	Rhinorrhœa ceased 44 days before discharge.
Nose — slight excoriation of right nares	49	Nil	Mother had sore throat after "infecting case" returned home.
Patch of seborrhœa over left eye, glands slightly enlarged	51	1 (age 3)	A sister (E. B.), aged 3, who has chronic rhinorrhœa has *not* had scarletfever.
Enlarged glands, impetigo spots about the nose	54	3 (ages 12, 5 and 4)	Had impetigo spots and enlarged tonsils after discharge.
Glands slightly enlarged	63	3 (ages 14, 12 and 9 days)	Had seborrhœa of scalp on discharge.

VIII.

Unrecognised Cases.

Unrecognised Cases.

Primary Cases.				Return Cases.		Unrecognised
No. of Case.	Name and Age.	Date of Discharge.	No. of Days in Hospital.	Name, Age, and Onset of Illness.	Interval.	Name, Age, and Onset of Illness.
407	C. C., age 8	6th Dec., 1901	35	E. C., age 3, onset 12th Dec.	6	B. H., age 1, onset 6th Nov.
						F. H., age 9, onset 20th Nov.
453	E. H., age 4	27th Feb., 1902	62	W. R., age 3, onset 12th March	13	E. R., age $1^{9}/_{12}$, onset 2nd March
421	M. S., age 10	27th Feb., 1902	45	W. S., age 15, onset 4th March	5	D. S., age 16, onset 15th Jan.
521	C. H., age 8	19th March, 1902	58	M. H., age 10 weeks, onset 24th April	36	Mrs. H., age 35, onset 10th March
550	E. M., age 33	14th May, 1902	49	C. S., age 6, onset 19th May	5	H. S., age 3, onset 17th May
126	E. McM., age 9	30th Sept., 1901	60	R. McM., age 18, onset 18th Oct.	18	S. McM., age 3, onset 18th Sept.
152	E. C., age 9	19th Oct., 1901	63	H. C., age 2, onset 1st Nov.	13	J. C., age 4, onset 26th Oct.
173	R. S., age 8	4th Nov., 1901	47	T. S., age 2, onset 13th Nov.	9	M. S., age 4, onset 5th Oct.
						Mrs. S., age 30, onset 6th Oct.

Cases.	Remarks.
Symptoms.	
Purulent rhinorrhœa. Died of broncho-pneumonia	The unrecognised cases were taken ill, while the infecting case was still in hospital. The return case was taken ill 22 days after ("F. H."), the second unrecognised case.
Headache, sore throat, swollen neck, delirium at night, "skin flushed" and feverish	
Slight rash, running from nose. Died. Post mortem examination broncho-pneumonia	The rash was "under the skin;" a "touch of measles" followed by pneumonia was diagnosed. The unrecognised case was taken ill 3 days after infecting case was discharged.
Rash on the chest, followed by general desquamation	The unrecognised case was taken ill 2 days after the infecting case was admitted to hospital. Three other cases of scarlet fever followed at intervals of 15, 13 and 20 days. The last case was the return case.
Profuse desquamation on the trunk and extremities	The unrecognised case was confined on Feb. 15th and remained in bed for 3 weeks. On March 10th she noticed profuse desquamation on the trunk and extremities. Shortly after her confinement she felt ill, but attributed it to milk fever, for which she was kept in bed longer than her usual time. The return case came home 9 days after his mother discovered the peeling.
Desquamation on the feet. Suffered from malaise, but no rash was observed	Five cases followed the unrecognised case at intervals of 2, 8, 3 and 15 days. The evidence obtained, leaves no doubt that the alleged infecting case was not the cause of the return cases. *The only person in this family who escaped was a child, aged 4, who suffered from rhinorrhœa*, the date of onset of which was uncertain.
Rash, sore throat, desquamation. Diagnosed, measles	Return case was taken ill 30 days after the unrecognised case, or 18 days after infecting case was discharged from hospital. The unrecognised case had a rash and sore throat followed by peeling, and at the same time a brother (A. McM.) was admitted to hospital suffering from scarlet fever.
Headache, sore throat. No rash seen. Desquamating on legs on Nov. 15th.	Unrecognised case was taken ill 7 days after infecting case was discharged. Six days later return case developed scarlet fever.
Earache, otorrhœa, headache, sore throat, and "flushed skin."	Return case was taken ill 39 days after the unrecognised cases, and 9 days after R. S. was discharged from hospital.
Malaise, headache, sore throat, and "flushed skin." Both desquamating profusely on hands and feet 27th Nov. the day of my first visit	

Primary Cases.				Return Cases.		Unrecognised
No. of Case.	Name and Age.	Date of Discharge.	No. of Days in Hospital.	Name, Age, and Onset of Illness.	Interval.	Name, Age, and Onset of Illness.
264	T. G., age 6	12th Dec., 1901	61	L. G., age 6, onset 23rd Dec.	11	E. G., age $1\,{}^{4}/_{12}$, onset 16th Dec.
						A. G., age 14, onset 24th Dec.
593	W. R., age 7	12th July, 1902	57	E. R., age 4, onset 17th July	5	L. R., age ${}^{7}/_{12}$, onset 17th July
				B. R., age 8, onset 18th July	6	
				M. R., age $2\frac{1}{2}$, onset 15th July	3	
568	A. G., age 3	13th June, 1902	47	J. G., age 9, onset 14th June	1	G. G., age 5, onset 22nd June

Cases.	Remarks.
Symptoms.	
" Rash under the skin." Throat very red.	First unrecognised case was taken ill 4 days after discharge of infecting case. Second unrecognised case was taken ill the day after return case.
" Skin flushed," glands painful and swollen, sore throat from 24th to 26th, skin very hot, thirsty	
Erythematous rash	Four cases followed the return case in rapid succession. The last one was diagnosed " gum rash."
Sorethroat, rhinorrhœa, otorrhœa. No rash or desquamation observed	The unrecognised case was taken ill 7 days after the return case was admitted to hospital.

IX.

Coincidences.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case (Interval.)	Infecting Case.
								Complications in Hospital.
51	B	Infecting case C. F.	1	3		3rd Aug., 1901		Nil
		Return cas F. D.	2	3	4-5th Aug., 1901		2	
		Return case C. D.	3	4	6th Aug., 1901		3	
248	B	Infecting case C. A.	1	17		6th Dec., 1901		Nil
		Return case S. A.	2		16th Dec., 1901		10	
62	B	Infecting case F. D.	1	17		12th April	—1	Nil
		Return case N. D.	2	15	11th April			
65	B	Infecting case F. F.	1	13		30th Aug.		Nil
		Return case F. F.	2	5	29th August		—1	
67	B	Infecting case E. J.	1	19		6th Sept.	—	Nil
		Return case A. J.	2	9	6th Sept.			
75	B	Infecting case E. R.	1	21		3rd Sept.		Nil
		Return case T. B.	2	24	4th Sept.		1	
105	B	Infecting case M. H.	1	8		3rd Oct.		Nil
		Return case E. H.	2	4	3rd Oct.		—	
		Return case F. H.	3	3	8th Oc .		5	
		Return case C. H.	4	12	22nd Oct.		19	
142	B	Infecting case W. D.	1	8		4th Nov.		Nil
		Return case E. D.	2	13	2nd Nov.		—2	
172	B	Infecting case D. K.	1	12		20th Sept.		Nil
		Return case H. K.	2	6	18th Sept.		—2	

Condition of Patients after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Rhinorrhœa	Room and clothes disinfected	Nil	Infecting case returned home at 5 p.m., August 3rd. Return case (No. 1) was taken ill midnight, August 4-5th, and was admitted to hospital on August 5th, suffering from diphtheria. *Before* the illness of the infecting case, his mother who goes out charing, used to leave him at the house of Mrs. D., who is a neighbour and the mother of the return cases F. D. and C.D, but after infecting case returned home he neither saw the return cases or had any communication (direct or indirect) with Mrs. D.'s family. It was alleged that C. F., who suffered while in hospital from scarlet fever only, was the cause of the return cases.
Nil	Satisfactory	3 (ages 13, 8 and 6)	Infecting case visited a house 5 days after discharge from hospital where 2 children were suffering from scarlet fever. On returning home she nursed the return case, who played with a fur boa which was worn in the sick room.
Nil	*See Section X.*		The return case was taken ill the day before alleged infecting case was discharged. The return case was one of a series of consecutive cases in this house.
Nil	Toys not disinfected	Nil	The rash came out the morning of the day that return case came home.
Nil	Satisfactory	Nil	The return case was taken ill the day infecting case came home.
Nil	Satisfactory	Nil	Infecting case and return case live in the same barracks, but did not meet after infecting case was discharged. There were other cases of scarlet fever in the barracks.
Fauces injected (slight)	Room into which patient was moved after illness began disinfected. Clothes washed at home	3 (ages 11, 8 and 7.)	When Mrs. H. returned from the hospital with the alleged infecting case, she found E. H. had been sent home from school feeling ill. The same evening the rash appeared.
Enlarged tonsils	Wearing apparel washed at home. Some were burnt	6 (ages 15, 11, 10, 9, 7 and 5.)	Return case was taken ill two days before alleged infecting case was discharged.
Nasal Catarrh	Wearing apparel fumigated		Return case was admitted to hospital day before infecting case was discharged. The return case was one of a series of consecutive cases that occurred in this house.

No. of Case.	Classification.		Serial No.	Age.	Date of Onset.	Date of Discharge.	Return Case (Interval.)	Infecting Case. Complications in Hospital.
192	B	Infecting case F. C.	1	6		28th Nov.		Rhinorrhœa
		Return case A. C.	2	3	23rd Nov.		—5	
		Return case L. C.	3	12½	28th Nov.		—	
209	B	Infecting case E. H.	1	18		14th Nov.		Nil
		Return case E. B.	2	21	2nd Dec.		18	
257	C	Infecting case R. E.	1	7		18th Dec.		Nil
		Return case K. E.	2	6	18th Dec.		—	
328	B	Infecting case C. D.	1	11		23rd Dec.		Nil
		Return case T. D.	2	2	29th Dec.		6	
550	B	Infecting case E. M.	1	33		14th May, 1902		Nil
		Return case C. S.	2	6	19th May, 1902		5	
600	B	Infecting case H. D.	1	31		19th July, 1902		Chronic enlarged tonsils
		Return case A. D.	2	7	17th July, 1902		—2	
		Return case L. D.	3	4	19th July, 1902			
407	C	Infecting case C. C.	1	8		6th Dec., 1901		Nil
		Return case E. C.	2	3	12th Dec., 1901		7	
		Return case L. C.	3	5	12th Dec., 1901			

Condition of Patients after Discharge.	Disinfection.	Susceptible Children.	Remarks.
Nasal Catarrh	Patient moved into another room after illness began. The last room was disinfected. Clothes washed at home		Case 3 was taken ill the same day as Case 1 was discharged and 5 days after a previous case in the same house.
Nil	Satisfactory	2 (ages 24 and 14.)	Infecting and return cases do not live in the same house, but work at the same place. Infecting case was taken ill before return case went back to business.
Nil	Satisfactory		Return case was one of a series of consecutive cases that occurred in this house, and was taken ill the same day infecting case was discharged.
Enlarged tonsils, fauces injected, nasal catarrh	Room occupied after patient was taken ill disinfected. Clothes washed at home, some destroyed	2 (ages 3 and 4.)	A sister of return case was admitted to hospital, certified to be suffering from scarlet fever, 4 days before infecting case was discharged. The return case was one of a series of consecutive cases in this house.
Nil	Satisfactory		The infecting case lives in the same house, but did not come in contact with return case. The outbreak which was followed by several other cases was caused by an unrecognised case, which subsequently peeled.
Nil	Satisfactory	Nil	A. D. was taken ill two days before her father was discharged from hospital.
Chronic enlarged tonsils. Glands palp: Desquamation on legs and arms and a little on feet	Clothes washed at home	2 (ages 9 and 7.)	Two unrecognised cases occurred in the house at intervals of 30 and 16 days, before infecting case was discharged.

X.

Home Disinfection.

Disinfection of Clothing. A portion disinfected.

No. of Case.	Classification.	Infecting Case. Name and Age.	Date of Admission.	Date of Discharge.	No. of days in Hospital.	Infecting Case. Complications in Hospital.	Condition of Patient after discharge.
62	B	A. H., age 9	2nd July, 1901	22nd Aug., 1901	51	Nil	Nil
246	C	V. S., age 12	3rd Oct., 1901	7th Dec., 1901	65	Nil	Skin of hands chapped
249	C	F. H., age 13	21st Oct., 1901	9th Dec., 1901	49	Nil	Nil
613	B	J. C., age 20	21st May, 1902	9th July, 1902	49	Nil	Skin of legs rough
27	C	S. P., age 8	2nd Dec., 1901	25th Jan., 1902	54	Nil	Post nasal discharge

Disinfection. Clothing fumigated.

No. of Case.	Classification.	Infecting Case. Name and Age.	Date of Admission.	Date of Discharge.	No. of days in Hospital.	Infecting Case. Complications in Hospital.	Condition of Patient after discharge.
82	B	J. T., age 7	11th June, 1901	10th Sept., 1901	83	Nil	Nil
109	C	W.C., age 3	7th August, 1901	26th Sept., 1901	50	Nil	Nil
125	C	P.M., age 7	28th Aug., 1901	18th Oct., 1901	51	Rhinorrhœa	Rhinitis
172	C	H.K., age 6	19th Sept., 1901	1st Nov., 1901	43	Nil	Cold
196	B	G.N., age 14	6th Sept., 1901	7th Nov., 1901	62	Nil	Desquamation on feet
219	C	C.C., age 11	20th Sept., 1901	6th Nov., 1901	47	Nil	Nil
229	B	A. T., age 7,	5th Oct., 1901	26th Nov., 1901	52	Nephritis	Nil

Return Case. Age and onset of illness.	Interval.	Disinfection.	Remarks.
F. H., age 8, 28th Aug., 1901	6	Room and bedding disinfected. Clothing ditto (except dress)	Dress worn on day of illness and day of discharge from hospital not disinfected.
M.S., age 10, 16th Dec., 1901	9	Room and bedding disinfected. Portion of clothes disinfected	Dress school coat and hat not disinfected. Infecting case nursed at home 4 days before admission to hospital.
A.H., age 18, 19th Dec., 1901	10	Room, bedding and linen disinfected	Dress washed at home.
R.C., age 22, 23rd July, 1902	14	Room and bedding disinfected. Some clothes disinfected	Dress worn at the commencement of her illness and after discharge not disinfected.
C.P., age 7, 30th Jan., 1902	5	Room and bedding disinfected. Some clothes disinfected	Jacket and dress not disinfected.

A.T., age 3, 18th Sept., 1901	8	Room and bedding disinfected. Blankets and sheets washed at home	Clothes fumigated.
H. C., age 2, 5th Oct., 1901	9	Room into which he was moved when illness began disinfected. Bedding ditto	Clothes fumigated.
W. M., age 10, 22nd Oct., 1901	4	Room and bedding disinfected	Clothes fumigated.
D.K., age 10, 19th Nov., 1901	18	Room and bedding disinfected	Clothes fumigated. Three cases occurred in this house at intervals of 56 and 62 days. 1st case, D.K., aged 12, was discharged day after case 2, the alleged infecting case, was admitted to hospital. 3rd case is the return case.
S.N., age 9, 23rd Nov., 1901	16	Room and bedding disinfected	Clothes fumigated. A series of cases occurred in this house. F. N. taken ill 18th August, treated at home. M. N. taken ill 27th August, interval 9 days. G. N. taken ill 4th September, interval 8 days. S. N. (return case) taken ill 23rd November, interval 80 days.
D.C., age 3, 27th Nov., 1901	21	Room and bedding fumigated	Clothes fumigated.
G. T., age 5, 30th Nov., 1901	4	Room last occupied disinfected	Clothes fumigated. Infected clothes worn on discharge.

No. of Case.	Classification.	Infecting Case. Name and Age.	Date of Admission.	Date of Discharge.	No. of days in Hospital.	Infecting Case. Complications in Hospital.	Condition of Patient after discharge.
276	B	G. S., age 3	19th Sept., 1901	23rd Nov., 1901	65	Adenitis	Nil
232	C	R. D., age 10	11th Dec., 1901	8th Feb., 1902	59	Nil	Rhinitis
263	C	H. H., age 7	27th Sept., 1901	4th Dec., 1901	68	Nil	Nil
393	C	S. C., age 5	22nd Dec., 1901	8th Feb., 1902	48	Nil	Otorrhœa and nasal catarrh
511	C	M. P., age 9	26th Feb., 1902	24th April, 1902	57	Rhinorrhœa	Rhinitis
542	B	D. K., age 3	5th March, 1902	28th April, 1902	54	Nil	Nil
Clothing disinfected by the application of antiseptics.							
467	C	A. L., age 12	28th Jan., 1902	24th March, 1902	55	Rhinorrhœa	Rhinorrhœa
501	A	L. A., age 3	11th Jan., 1902	3rd April, 1902	82	Rhinorrhœa	Catarrh
Wearing apparel washed after fumigation or spraying.							
24	C	L. E., age 8	4th Nov., 1901	21st Jan., 1902	78	Otorrhœa	Nil
227	C	L. B., age 6	10th Oct., 1901	4th Dec., 1901	55	Nil	Nil
236	C	A. L., age 9	7th Oct., 1901	30th Nov., 1901	54	Rhinorrhœa	Rhinorrhœa
497	A	H. O., age 4	15th Jan., 1902	14th March, 1902	58	Nil	Rhinorrhœa

Return Case. Age and onset of illness.	Interval.	Disinfection.	Remarks.
H. S., age 30, 14th Dec., 1901	21	Bedding not disinfected	Clothes fumigated.
F. D., age 8, 25th Feb., 1902	17	Room last occupied disinfected. Bedding disinfected. Mattress not disinfected	Dress fumigated.
F. H., age 15, 15th Dec., 1901	11	Room fumigated	Suit of clothes fumigated. Infected suit worn on discharge.
A. C., age 1, 16th Feb., 1902	8	Room and under-mattress fumigated. Bedding disinfected	Clothes fumigated. A series of consecutive cases occurred in this house at intervals of 11, 16 and 40 days. The last case was the return case.
J. P., age 3, 4th May, 1902	10	Room and bedding fumigated	Clothes fumigated. Infected dress worn on discharge.
A. K., age 15, 7th May, 1902	9	Room and bedding disinfected	Clothes fumigated on each occasion. A series of cases occurred in this house. 1st case, onset of illness 4th March, discharged 28th April. 2nd and 3rd cases, onset of illness 15th April; 4th and 5th cases, onset of illness 24th April; 6th case, onset of illness 7th May. The 6th case (the return case) occurred 13 days after cases 4 and 5 were taken ill, or 9 days after case 1 was discharged from hospital.

H. L., age 3, 28th March, 1902	4	Room and bedding disinfected	Clothes "smothered with Sanitas, then put out to air."
G. L., age 7, 6th April, 1902	3	Room and bedding disinfected	Clothes "disinfected with carbolic."

W. E., age 16, 7th Feb., 1902	17	Room and bedding disinfected. Clothes sprayed. Under-mattress not disinfected	Linen washed at home.
A. B., age 4, 7th Dec., 1901	3	Room and bedding disinfected. Clothes not disinfected	Clothes washed 5 days after fumigation.
H. L., age 6, 10th Dec., 1901	10	Last room occupied after illness began disinfected. Bedding disinfected. Clothes not disinfected	Clothes washed after fumigation.
G. O., age 1, 5th April, 1902	22	Room disinfected. Two beds in the room, one only disinfected. Clothes sprayed	Linen washed at home.

Disinfection of infected clothing, "Not considered necessary."

No. of Case.	Classification.	Infecting Case. Name and Age.	Date of Admission.	Date of Discharge.	No. of days in Hospital.	Infecting Case. Complications in Hospital.	Condition of Patient after discharge.
254	A	H. C., age $1\frac{10}{12}$	13th Sept., 1901	12th Dec., 1901	90	Rhinorrhœa	Rhinorrhœa for a day or two
296	C	A. F., age 4	16th Oct., 1901	24th Dec., 1901	69	Nil	Rhinitis
474	C	C. A., age 6	5th Dec., 1901	10th March, 1902	95	Otorrhœa, rhinorrhœa, and pertussis	Rhinorrhœa
550	B	E. M., age 33	26th March, 1902	14th May, 1902	49	Nil	Nil
582	A	T. E., age 7	5th May, 1902	25th June, 1902	51	Nil	Nil
20	B	L. B., age 3	9th Jan., 1902	28th Feb., 1902	50	Nil	Nil

Wearing apparel not disinfected.

142	B	W. D., age 8	13th Sept., 1901	4th Nov., 1901	52	Nil	Enlarged tonsils
161	B	J. C., age 6	8th Sept., 1901	8th Nov., 1901	61	Nil	Nil
253	B	H. H., age 12	20th Sept., 1901	18th Nov., 1901	59	Adenitis and albuminuria	Skin rough
314	B	G. G., age 4	11th Nov., 1901	1st Jan., 1902	51	Nil	Nil
368	C	E. O., age 9	8th Dec., 1901	13th Jan., 1902	36	Mastoid abscess	Nil

Return Case. Age and onset of illness.	Interval.	Disinfection.	Remarks.
M. C., age 3, 15th Dec., 1901	3	Room, bedding and clothing disinfected	*Return case.*—Clothes not disinfected, as the patient was in bed when the illness began.
H. F., age 7, 27th Dec., 1901	3	Room and bedding disinfected. Clothes washed at home	Room into which patient was moved after illness began, disinfected. Clothing:—Wearing apparel not disinfected, as the children were in bed when the illness began.
S. A., age 4, 31st March, 1902	21	Room and bedding disinfected. Wearing apparel not disinfected	Suit was not disinfected as patient was in bed a week before the illness was diagnosed.
H. S., age 3, 17th May, 1902	3	Room and bedding disinfected. Clothes not disinfected	Dress not considered infected as she was in bed 2 days before the illness began. Under-mattress not disinfected.
G. E., age 10, 5th July, 1902	10	Room and bedding disinfected. Clothes not disinfected	Clothes not disinfected as he was in bed when the illness began.
J. B., age 3, 10th March, 1902	10	Room and bedding disinfected. Clothes not disinfected	Clothes not disinfected, as there was no necessity, for she was in bed 2 days before the rash came out.
E. D., age 13, 2nd Nov., 1901	—2	Room and bedding disinfected	Clothes not disinfected, some washed, others burnt. A case occurred in this house 9 days after infecting case was admitted to hospital, and return case was taken ill two days before infecting case was discharged.
S. C., age 2, 13th Nov., 1901	5	Room and bedding disinfected	Clothes not disinfected. No questions asked about infected clothing. The mother of return case was taken ill with sore throat the day before return case.
C. T., age $\frac{10}{12}$, 6th Dec., 1901	18	Room last occupied disinfected. Bedding disinfected	Clothes not disinfected. A series of cases occurred in this house while infecting case was in hospital.
H. G., age $1\frac{8}{12}$, 3rd Jan., 1902	2	Room and bedding disinfected	Clothes not disinfected or washed. Clothes were put away in a box and brought out the day infecting case was discharged from hospital.
J. O., age 8, 26th Jan., 1902	13	Room and bedding disinfected	Wearing apparel not disinfected. Infecting case went from home from January 16th to 30th. Return case was taken ill 26th January.

No. of Case.	Classification.	Infecting Case. Name and Age.	Date of Admission.	Date of Discharge.	No. of days in Hospital.	Infecting Case. Complications in Hospital.	Condition of Patient after discharge.
588	B	J. C., age 8	24th April, 1902	28th June, 1902	65	Nil	Throat not healthy

Sunday clothes not disinfected.

176	A	E.F., age 9	13th Sept., 1901	9th Nov., 1901	57	Nil	Nil
255	C	H.M., age 3	28th Aug., 1901	30th Oct., 1901	63	Nil	Nil
343	A	F.B., age 10	27th Nov., 1901	18th Jan., 1902	52	Rhinitis	Rhinitis
450	C	L.M., age 6	9th Jan., 1901	11th March, 1902	61	Rhinorrhœa	Desquamation on feet

Clothing "sent to the cleaners."

443	B	E.C., age 18	7th Nov., 1901	16th Dec., 1901	39	Nil	Nil
603	A	D.G., age 6	24th May, 1902	21st July, 1902	58	Nephritis	Nil

Clothing "put out in the yard to air."

2	A	W. B., age 7	6th June, 1901	20th July, 1901	44	Nil	Fauces injected
66	C	E. A., age 13	17th June, 1901	28th Aug., 1901	72	Nil	Nil
72	B	J. C., age 7	12th July, 1901	4th Sept., 1901	54	Nil	Seborrhœa
51	B	E.W., age 4	17th Dec., 1901	6th Feb., 1901	51	Nil	Nil
79	B	A. H., age 5	12th Feb., 1902	12th May, 1901	89	Nil	Nil

Return Case. Age and onset of illness.	Interval.	Disinfection.	Remarks.
R. C., age $\frac{10}{12}$, 2nd July, 1902	5	Room and bedding disinfected	Wearing apparel not disinfected.
W.F., age 8, 15th Nov., 1901	16	Room, bedding, and every day clothes disinfected	Best clothes worn first day of illness (Sunday) not disinfected.
A.M., age 4, 15th Dec., 1901	46	Room, bedding, and every day clothes disinfected	Dress worn first day of illness (Sunday) not disinfected. It was brought out again for general use seven days before return case was taken ill.
S.B., age 3, 24th Jan., 1902	6	Room, bedding, and every day clothes disinfected	Clothes worn first day of illness (Sunday) not disinfected.
C.M., age 2, 16th Mar., 1902	5	Room and bedding disinfected; school clothes fumigated	Clothes worn first day of illness (Sunday) not disinfected.
V.C., age 13, 27th Feb., 1902	73	Room and bedding disinfected	Dress and jacket "sent to the cleaners."
R.G., age 4, 24th July, 1902	3	Room and bedding disinfected	Hat and coat not disinfected but "sent to the cleaners."
C. B., age 9, 28th July, 1901	8	Room and bedding disinfected. Linen washed at home	Dress "aired in the yard."
G. A., age 15, 4th Sept., 1901	7	Room and bedding disinfected. All clothing except dress disinfected	Dress "aired in the yard."
R. C., age 5, 8th Sept., 1901	4	Room and bedding disinfected. No wearing apparel disinfected. Linen washed at home	Dress fumigated, afterwards "aired in the yard."
A. W., age 2, 23rd Feb., 1901	17	Room and bedding disinfected. Clothes worn in bed (night shirt and vest) disinfected. Clothes washed at home	School jacket "aired in the yard."
E. H., age 6, 18th May, 1901	6	*Return case.*—Room and bedding disinfected. No clothes disinfected. Linen washed	Dress "aired in the yard."

No. of Case.	Classification.	Infecting Case.	Date of Admission.	Date of Discharge.	No. of days in Hospital.	Infecting Case.	Condition of Patient after discharge.
		Name and Age.				Complications in Hospital.	
104	A	K.W., age 9	7th July, 1901	24th Sept., 1901	79	Nil	Cold in the nose
358	C	A. H., age 4	6th Dec., 1901	17th Jan., 1902	42	Rhinorrhœa	Rhinitis
345	B	T.C., age 15	1st Dec., 1901	13th Jan., 1902	43	Otorrhœa	Peeling on the heels
561	C	W. L., age 13	3rd April, 1902	2nd June, 1902	60	Nil	Rhinitis
592	C	H. B., age 9	24th March, 1902	12th July, 1902	110	Rhinorrhœa	Rhinorrhœa
596	C	H. A., age 2	18th May, 1902	10th July, 1902	52	Nil	Fauces morbid
594	C	L. L., age 10	12th May, 1902	2nd July, 1902	51	Nil	Nil

Clothing "got rid of."

30	A	A. S., age 3	28th May, 1902	24th July, 1901	57	Nil	Rhinorrhœa
74	B	J. S., age 4	17th June, 1901	15th Aug., 1901	59	Nil	Nil
279	A	W.W., age 9	4th Oct., 1901	20th Dec., 1901	77	Otorrhœa	Rhinitis
307	C	H. R., age 14	24th Sept., 1901	31st Dec., 1901	98	Eczema	Rhinitis
562	C	J M. age 7	3rd Jan., 1902	19th March, 1902	75	Otorrhœa	Nil

Return Case. Age and onset of illness.	Interval	Disinfection.	Remarks.
J. W., age $^{9}/_{12}$, 3rd Oct., 1901	9	Room and bedding disinfected. Sheets washed at home. Clothes not disinfected, washed at home	Best dress "aired in the yard."
M. H., age 9, 19th January, 1902	2	Room last occupied by patient disinfected. Bedding disinfected (sheets washed at home). Wearing apparel disinfected	School jacket "aired in the yard." After A. H. was taken ill he was moved into his parents' room.
R. C., age 10, 15th Jan., 1902	2	Room and bedding disinfected. Clothes not disinfected. Linen washed	Dress "aired in the yard."
E. L., age 13, 10th June, 1902	8	Room last occupied by patient disinfected. Bedding ditto	As soon as patient was discovered to be ill, he was moved into his parents room. Clothes fumigated, afterwards "put out on the clothes line to air."
G. B., age 3, 14th July, 1902	2	Room and bedding disinfected	Afterwards "put out in the yard to air."
M. A., age 2, 18th July, 1902	8	Room and bedding disinfected	Clothes fumigated, afterwards "put out in the yard to air."
W. L., age 4, 13th July, 1902	11	Room and bedding disinfected	Clothes fumigated, afterwards "put out in the yard to air."

H. S., age 5, 31st July, 1901	7	Room and bedding disinfected. Under-mattress not disinfected	Clothes not disinfected but "got rid of."
E. S., age 41, 8th Sept., 1901	24	*Return case.* Room and bedding not disinfected	Clothes not disinfected as they are "too old." "They will probably be got rid of."
E. W., age $1\frac{9}{12}$, 23rd Dec., 1901	3	Room and bedding disinfected. Trousers and waistcoat disinfected	Coat "too old to disinfect," it was "given away for a piece of hearthstone."
T. R., age 14, 9th Jan., 1902	9	Room and bedding disinfected	Wearing apparel fumigated, have not been washed, "waiting to get rid of them."
W. M., age 8, 31st Mar., 1902	12	Room and bedding disinfected	Suit of clothes "got rid of."

Room or bed last occupied by patient disinfected.

No. of Case.	Classification.	Infecting Case.	Date of Admission.	Date of Discharge	No. of days in Hospital.	Infecting Case.	Condition of Patient after discharge.
		Name and Age.				Complications in Hospital.	
6	A	E. S., age 7	22nd June, 1901	22nd Nov., 1901	153	Otorrhœa	Otorrhœa
50	C	J. S., age 6	12th Feb., 1902	14th June, 1902	122	Nephritis and rhinorrhœa	Rhinitis
62	B	F. D., age 17	5th Feb., 1902	12th April, 1902	66	Nil	Nil
148	B	H. H., age 8	28th Aug., 1901	28th Oct., 1901	61	Nil	Nil
149	B	F.W.,age 20	30th Aug., 1901	15th Oct., 1901	46	Nil	Nil
297	A	V. R., age 7	12th Nov., 1901	23rd Dec., 1901	41	Nil	Rhinitis
386	A	F. S., age 7	28th Nov., 1901	29th Jan., 1902	62	Nil	Rhinitis
154	A	J. G., age 9	12th Aug., 1901	24th Oct., 1901	73	Otorrhœa	Rhinitis, otorrhœa
442	B	K.G., age 11	23rd Nov., 1901	5th Feb., 1902	74	P.S. Diphtheria, nephritis	Rhinitis
458	A	A. B., age 2	22nd Jan., 1902	10th March, 1902	47	Otorrhœa, rhinorrhœa	Rhinitis, eczema

Return Case.	Interval.	Disinfection.	Remarks.
Age and onset of illness.			
B. S., age 10, 24th Nov., 1901	2	Bedding and clothes fumigated	When patient was taken ill, he was moved into another room, only the last room occupied disinfected.
S., age 1, 21st June, 1902	7	Parlour and clothes disinfected. Cushions on sofa disinfected	Only room into which patient was moved after illness began disinfected.
N. D., age 15, 11th April, 1902	—1	Room, bedding and clothing disinfected	When the children were taken ill they were moved upstairs. Room last occupied disinfected. This room was disinfected six times in 15 months. *No other room disinfected.*
J. H., age 14, 1st Nov., 1901	4	Bedding and wearing apparel disinfected	When the children were taken ill they were moved into the kitchen. Only the room last occupied disinfected. This was done three times.
A.W., age 10, 12th Nov., 1901	28	Bedding disinfected. Clothing fumigated	Infecting case was taken ill and went to bed on the 28th. Three days later she was moved into another room to see the doctor. Was in the latter room 3 hours before removal to hospital. *Only the room last occupied disinfected.*
D.R., age 5, 28th Dec., 1901	5	Bed made up on sitting-room sofa disinfected	Room last occupied disinfected. Bedroom not disinfected as the child was taken ill in the sitting-room.
E. S., age 2, 9th Feb., 1902	11	*Return case.* Room disinfected, clothing disinfected. Bed last occupied not disinfected	Patient was moved into her mother's bed after she was taken ill. Mother's bed fumigated. Child's bed disinfected.
M.G., age 17, 31st Oct., 1901	7	Room disinfected, clothes (some of them) disinfected. Bedding, a portion disinfected	When the children were taken ill they were moved on to the sofa. Bedding on the sofa disinfected.
W.G., age 23, 12th March, 1902	35	Room last occupied disinfected. Wearing apparel fumigated. Bedding disinfected (sheets and blankets washed at home). Palliasse not disinfected	Room into which patient was moved after illness began disinfected. Under mattress "*only disinfected in special cases.*"
E.B., age 4, 18th March, 1902	8	*Infecting case.* Bedroom and bedding disinfected. Clothes not disinfected	*Return case.* "Kitchen only disinfected, as the rash came out while the child was there."

No. of Case.	Classification.	Infecting Case. Name and Age.	Date of Admission	Date of Discharge.	No. of days in Hospital.	Infecting Case. Complications in Hospital.	Condition of Patient after discharge.
533	C	R. K., age $\frac{11}{12}$	24th Feb., 1902	27th March, 1902	31	Nil	Otorrhœa
517	A	R. D., age 18	1st March, 1902	16th April, 1902	46	Tonsillitis	Fauces inflamed
601	B	E. S., age 7	22nd April, 1902	24th June, 1902	63	Nil	Nil
610	C	T. B., age 3	6th June, 1902	21st July, 1902	45	Nil	Desquamation on feet
253	B	H. H., age 12	20th Sept., 1901	18th Nov., 1901	59	Adenitis, albuminuria	Skin over trunk and extremities very dry and rough
Desquamating Cases.							
421	B	M.S., age 10	13th Jan., 1902	27th Feb., 1902	45	Nil	Nil
449	A	A. B., age 6	30th Nov., 1901	19th Feb., 1902	81	Rhinorrhœa	Rhinorrhœa
521	B	C. H., age 8	20th Jan., 1902	19th March, 1902	58	Nil	Nil

Return Case. Age and onset of illness.	Interval.	Disinfection.	Remarks.
G. K., age 7, 20th April, 1902	24	Bedroom last occupied disinfected. Bedding and wearing apparel disinfected	When the children were taken ill, they were moved from the rooms they sickened in, to a spare room. Only the room last occupied disinfected. Three cases occurred subsequent to the first at intervals of 3, 11 and 40 days. The last case was the return case.
W. D., age 13, 1st May, 1902	15	Bedding and wearing apparel disinfected. Room last occupied disinfected	Patient went to see a doctor, who told him he had scarlet fever. He returned home ; a chair bed was made up for him in the parlour. The room last occupied disinfected.
C. S., age 13, 23rd July, 1902	29	Room sulphured. Clothes washed at home after fumigation	When infecting case was taken ill she was moved into her parents' bed. Only the last bed occupied disinfected. Palliasse not disinfected.
A. B., age 32, 25th July, 1902	4	Room and clothes disinfected. Bed last occupied disinfected	When infecting case was taken ill, he was moved into his parents' bed. Only the last bed occupied disinfected.
C. T., age $\frac{10}{12}$, 6th Dec., 1901	18	Room last occupied disinfected. Clothes not disinfected. Bedding disinfected	Infecting case usually sleeps up stairs, but when he was taken ill he was brought down to his parents' room. Three subsequent cases occurred in this house, at intervals of 10 and 14 days, while infecting case was still in hospital. After the infecting case was discharged, the infection spread to a family living in the same house.

W. S., age 15, 4th March, 1902	5	Bedding, room and clothes disinfected	D. S., aged 16, contracted scarlet fever 2 days after infecting case. The case was not recognised until late in the illness, when she was isolated for a time at home. During the early part of her illness, D. S. went about the house. *Living room not disinfected.* Cases occurred in this house at intervals of 15, 13 and 20 days. The last case was the return case.
T. D., age 2, 26th Feb., 1902	7	Bedding, room and clothes disinfected	*Return case* admitted to hospital desquamating. He was not confined to bed and had been about the house. *Living room not disinfected.*
M. H., age 10 weeks, 24th April, 1902	36	Bedding, room and clothes disinfected	*Infecting case* ill 3 days before she was confined to bed. *Living room not disinfected.*

No. of Case.	Classification.	Infecting Case.	Date of Admission.	Date of Discharge.	No. of days in Hospital.	Infecting Case.	Condition of Patient after discharge.
		Name and Age.				Complications in Hospital.	
498	C	M. R., age 3	24th Dec., 1901	10th March, 1902	76	Rhinorrhœa, otorrhœa	Rhinitis

Bedding. A portion disinfected.

188	A	G. S., age 6	16th Sept., 1901	15th Nov., 1901	60	Rhinorrhœa	Glands enlarged, skin on heels rough
431	A	C.W., age 7	2nd Dec., 1901	5th March, 1902	93	Rhinorrhœa	Rhinitis
432	A	E. G., age 9	17th Oct., 1901	27th Feb., 1902	133	Nil	Rhinitis
465	C	M. J., age 4	19th Dec., 1901	5th March, 1902	76	Nil	Nil
568	B	A. G., age 3	27th April, 1902	13th June, 1902	47	Measles	Nil
187	C	C. A., age 6	4th Sept., 1901	2nd Nov., 1901	59	Nil	Rhinitis
463	A	A. M., age 2	20th Dec., 1901	12th March, 1902	82	Diphtheria, rhinorrhœa	Rhinorrhœa

Disinfection. "Done privately."

258	B	E. T., age 9	14th Oct., 1901	29th Nov., 1901	46	Nil	Nasal catarrh
480	B	G. C., age 3	14th Feb., 1902	5th April, 1902	50	Nil	Nil
552	B	E. W., age 7	9th Feb., 1902	14th April, 1902	64	Otorrhœa, rhinorrhœa	Nil

Return Case. Age and onset of illness.	Interval.	Disinfection.	Remarks.
G. R., age 8, 16th April, 1902	37	Bedding, sitting room and clothes disinfected	When the children were taken ill they were kept in the sitting room. Room last occupied disinfected. When the rash was first observed they were running about. *Bedroom not disinfected.*

W. S., age 8, 20th Nov., 1901	5	Room and mattress disinfected. No washing things disinfected	Blankets, sheets and patient's clothes washed at home.
A. W., age 4, 13th March, 1902	8	Room and top mattress disinfected. Under mattress fumigated	Blankets, sheets, patient's clothes and other washing things washed at home.
F. G., age 30, 3rd March, 1902	4	Room and bedding disinfected. Clothes burnt	*Return case.*—Wearing apparel, sheets and palliasse not disinfected. Two beds in the room, one only disinfected.
E. J., age 3, 11th March, 1902	6	Room, clothing and bedding disinfected	Two beds and a cradle in the room. Cradle only disinfected.
J. G., age 9, 14th June, 1902	1	Room, clothing and bedding disinfected	Under-mattress not disinfected.
R. A., age 5, 6th Nov., 1901	4	Bedroom, bedding and clothes disinfected	*Infecting and return case.* — The children were ill a few days before admission to the hospital, and were nursed during the day-time in a perambulator in the kitchen. Neither perambulator or kitchen disinfected.
L. M., age 1, 20th March, 1902	8	*Return case.* Bedroom and bedding not disinfected. Clothes disinfected	The *return case* was nursed during the day in a perambulator in the kitchen. Perambulator and kitchen disinfected but not bedroom.

W.T., age 13, 18th Dec., 1901	19	Room, bedding and clothes fumigated	Disinfection "done privately" by tenants.
M. D., age 10, 13th April, 1902	8	*Return case.* — Room, bedding and wearing apparel fumigated	Disinfection "done privately" by occupants. Clothes afterwards put out in the yard.
W. W., age 14, 26th May, 1902	42	Room, bedding and wearing apparel fumigated	Disinfection "done privately" by tenants.

Evading disinfection.

No. of Case.	Classification.	Infecting Case. Name and Age.	Date of Admission.	Date of Discharge.	No. of days in Hospital.	Infecting Case. Complications in Hospital.	Condition of Patient after discharge.
70	C	J. L., age 6	21st June, 1901	21st Aug., 1901	61	Nil	Rhinorrhœa
94	C	T. R., age 7	22nd July, 1901	7th Sept., 1901	47	Nil	Rhinitis
156	C	A. G., age 7	16th Sept., 1901	25th Oct., 1901	39	Nil	Rhinitis
266	C	A. R., age 12	13th Oct., 1901	6th Dec., 1901	54	Nephritis	Rhinitis
365	C	E. F., age 9	5th Dec., 1901	20th Jan., 1902	46	Nil	Desquamating
408	C	L. C., age 5	13th Dec., 1901	27th Jan., 1902	45	Nil	Rhinitis
419	C	W. W., age 6	1st Jan., 1902	26th Feb., 1902	56	Nephritis	Rhinitis
519	A	L. S., age 14	15th Feb., 1902	18th April, 1902	62	Otorrhœa	Nasal catarrh

Clothing and bedding washed at home. Some objections.

No. of Case.	Classification.	Infecting Case. Name and Age.	Date of Admission.	Date of Discharge.	No. of days in Hospital.	Infecting Case. Complications in Hospital.	Condition of Patient after discharge.
9	A	K. H., age 6	17th Sept., 1901	28th Dec., 1901	102	Scarlet fever	Rhinitis
47	B	R. G., age 8	18th Nov., 1901	21st Jan., 1902	64	Nil	Nil

Return Case. Age and onset of illness.	Interval.	Disinfection.	Remarks.
A. L., age 10, 6th Sept., 1901	16	Room, bedding and clothes disinfected	As soon as parent discovered what her child was suffering from "everything was moved out of the sick room, so that the sanitary authority would have very little to disinfect."
D. R., age 3, 26th Sept., 1901	19	Room, bedding and clothes disinfected	The doctor said, "if you have anything of value in the room you had better move them into another room, as your son is going to have scarlet fever." The rash was then out.
L. G., age 9, 3rd Nov., 1901	9	Room last occupied by patient disinfected. Bedding and clothes disinfected	As soon as the child was discovered to be suffering from scarlet fever, a bed was made for him in the front room. Blankets were changed for old ones "as they do spoil them so."
L. R., age 5, 20th Dec., 1901	14	Room and bedding disinfected. Clothes washed at home	When the patient was taken ill everything was moved out of the sick room.
C. F., age 8, 6th Feb., 1902	17	Room, bedding and clothes disinfected	*Return case.*—Clothes were not disinfected "as they spoiled them the first time."
A. C., age 7, 17th Feb., 1902	21	Room and bedding disinfected. Clothes washed at home	As soon as the child was taken ill, everything was moved out of the room.
E.W., age 15, 2nd March, 1902	4	Room, bedding and clothes disinfected	*Return case.*—Room last occupied by patient disinfected. Blankets "were changed for old ones to save them."
E. S., age 20, 2nd May, 1902	14	Room and bedding disinfected. Clothes washed at home	*Return case.*—Bedding not disinfected "as they spoiled them on the first occasion."

E. H., age 8, 30th Dec., 1901	2	Room last occupied disinfected. Clothes not disinfected. Bedding disinfected	Infecting case was moved into her parents' room after she was taken ill. This room only was disinfected. The mother of infecting case washes once a week, as the wash-house is engaged on other days. She was therefore obliged to burn the child's clothes.
L. G., age 1, 21st Jan., 1902	—0	*Infecting case.*—Bedroom, bedding and clothes disinfected	*Return case.*—Clothes were not disinfected, but are at present stored in the wash-house, until a convenient opportunity arises for washing them.

No. of Case.	Classification.	Infecting Case.	Date of Admission.	Date of Discharge.	No. of days in Hospital.	Infecting Case.	Condition of Patient after discharge.
		Name and Age.				Complications in Hospital.	
237	A	F. H., age 4	3rd Oct., 1901	22nd Nov., 1901	50	Nil	Nil
404	A	G. J., age 4	30th Nov., 1901	1st Feb., 1902	63	Nil	Nasal catarrh
472	B	A.C., age 10	9th Dec., 1901	5th Feb., 1902	58	Nil	Nil
471	C	F. O., age 4	23rd Jan., 1902	12th March, 1902	48	Nil	Nasal catarrh
565	A	R. J., age 4	14th Feb., 1902	30th May, 1902	105	Relapse of scarlet fever	Rhinitis
566	A	J. G., age 4	4th March, 1902	10th May, 1902	67	Nil	Rhinitis

Return Case. Age and onset of illness	Interval.	Disinfection.	Remarks.
N. H., age 8, 3rd Dec., 1901	11	*Infecting case.* — Room last occupied disinfected. Clothes washed at home. Bedding disinfected.	*Return case.* — Wearing apparel not disinfected. Patient on "D. N." and mother visits the hospital three times a day. She has had no time up to the present to wash the infected clothing. Return case now in hospital 5 days.
M. R., age 1, 6th Feb., 1902	5	Room and bedding disinfected. Clothes washed at home	Eight families use the same wash-house.
A. C., age 8, 20th Feb., 1902	15	Room and bedding disinfected. Clothes not disinfected	Family occupy one room (bed-sitting room). Washing done in this room, as it was too cold and inconvenient to use the wash-house. The mother takes in fancy needle-work.
W. O., age 5, 28th March, 1902	16	*Infecting case.*—Room and bedding disinfected	*Return case* lives in a large tenement. Once a week a wash-house is reserved for the families from infected houses. The mother of return case burnt her son's clothes as she would have to wait 5 days.
F. J., age 7, 12th June, 1902	13	Room and wearing apparel disinfected. Some of the bedding disinfected	Sheets and curtains left to be washed. They have not yet been washed, but are used to cover the disinfected mattress and pillows, while the room is being repapered and whitewashed.
F. G., age 30, 14th May, 1902	4	*Infecting case.* — Room sulphured. Wearing apparel burnt. Bed disinfected	*Return case.*—Two beds in the infected room. (Children and parents). Parents' bed disinfected. Top mattress, blankets and pillows taken away. Infected linen left on the bed. A neighbour promised to wash them, but her household duties have up to the present prevented her.

SCARLET FEVER.

Seasonal Incidence of Return Cases.

Tables 1, 2 and 3.

SEASONAL INCIDENCE OF RETURN CASES.

TABLE showing the number of patients discharged each month, the number and percentage that were subsequently "Infecting Cases," also the daily average number of patients under treatment when they were discharged. See Chart IV. (1)

Month.	Patients under Treatment. (Daily Average.)	Patients Discharged.	Infecting Cases.	Percentage of Infecting Cases *on Discharges.*
July, 1901 ...	2900	1201	35	2·9
August ,, ...	3081	1275	39	3·0
September ,, ...	3062	1502	40	2·6
October ,, ...	3215	1538	55	3·5
November ,, ...	3271	1582	85	5·3
December ,, ...	3094	1322	83	6·2
January, 1902 ...	2715	1633	74	4·5
February ,, ...	2360	1110	57	5·1
March ,, ...	2157	1232	58	4·7
April ,, ...	2128	975	45	4·6
May ,, ...	2181	1089	38	3·4
June ,, ...	2350	939	31	3·3
July ,, ...	2360	1304	48	3·6

TABLE showing the number of patients admitted each month, the number and percentage of these that were "Infecting Cases" subsequent to discharge from hospital, also the daily average number of patients under treatment when they were admitted. See Chart IV. (2)

Month.	No. of Patients under Treatment. (Daily Average.)	No. of Patients Admitted.	No. of Infecting Cases.	Percentage of Infecting Cases *on Admissions.*	
June, 1901 ...	2557	1369	50	3·6	3·39
July ,, ...	2900	1561	53	3·3	
August ,, ...	3081	1278	40	3·1	
September ,, ...	3062	1711	98	5·7	5·08
October ,, ...	3215	1726	80	4·6	
November ,, ...	3271	1516	74	4·8	
December ,, ...	3094	1294	62	4·7	4·83
January, 1902 ...	2715	1146	59	5·0	
February ,, ...	2360	911	43	4·7	
March ,, ...	2157	1066	31	2·9	3·04
April ,, ...	2128	1077	26	2·4	
May ,, ...	2181	1174	44	3·7	

TABLE showing the number of Scarlet Fever notifications each month, the number of houses in which infection reappeared subsequent to the return home of a patient from Hospital, irrespective of the time when the "infecting case" was discharged, and the number of Return Cases that occurred in the corresponding months. (3)

Month.		Notifications.	No. of houses in which Infection reappeared. (Infecting Cases.	No. of Return Cases.	Percentage of Infecting Cases on Notifications	Percentage of Return Cases on Notifications.
July, 1901	...	2145	27	36	1·2	1·6
August ,,	...	1402	31	43	2·2	3·0
September ,,	...	2045	39	66	1·9	3·2
October ,,	...	2922	45	61	1·5	2·
November ,,	...	1768	76	105	4·2	5·9
December ,,	...	1547	89	119	5·7	7·6
January, 1902	...	1797	76	110	4·2	6·1
February ,,	...	1243	66	84	5·3	6·7
March ,,	...	1256	60	86	4·7	6·8
April ,,	...	1578	48	63	3·0	4·0
May ,,	...	1381	41	60	2·9	4·3
June ,,	...	1482	31	46	2·0	3·1
July ,,	...	1911	40	51	2·0	2·6

Period of Detention of Scarlet Fever Patients

Tables 4-24.

TABLE showing *for each hospital* the number of patients discharged each month. (4)

	E. H.	S. E. H.	N. E. H.	W. H.	S. W. H.	N. W. H.	P. H.	B. H.	G. H.	F. H.	G. F. H.	N. H.	Total.	Average Period of Detention.
Aug., '01	8	10	116	89	54	79	124	94	5	153	154	389	1275	66·12
Sept. ,,	12	33	113	93	67	74	223	107	2	187	299	292	1502	68·81
Oct. ,,	6	52	122	47	58	52	245	166	3	191	70	526	1538	64·27
Nov. ,,	4	39	101	64	70	43	271	153	1	228	*	608	1582	59·60
Dec. ,,	10	34	88	65	51	70	242	128	4	211	...	419	1322	59·23
Jan., '02.	9	42	157	86	89	73	241	180	5	180	...	571	1633	66·97
Feb. ,,	25	50	146	79	74	106	164	112	2	167	...	185	1110	69·30
March ,,	19	76	169	109	95	136	158	147	6	224	...	93	1232	69·05
April ,,	1	48	160	76	94	108	143	125	3	176	...	41	975	67·02
May ,,	4	33	103	74	94	61	137	141	7	156	...	279	1089	64·30
June ,,	...	37	79	70	72	53	126	112	6	90	...	294	939	64·29
July ,,	12	27	124	71	57	66	141	182	3	158	...	463	1304	58·0
TOTAL ...	110	481	1478	923	875	921	2215	1647	47	2121	523	4160	15,501	...
Average period of detention	60·17	64·81	69·55	69·85	71·61	65·0	53·14	64·5	57·20	60·68	64·72	68·46	64·57	...

* Hospital closed.

TABLE showing *for each hospital* the average period of detention (in days) of All Cases discharged each month. (5)

	E. H.	S. E. H.	N. E. H.	W. H.	S. W. H.	N. W. H.	P. H.	B. H.	G. H.	F. H.	N. H.	G. F. H.	Total.
August, 1901	88·83	84·16	61·70	58·90	55·48	61·21	65·80	65·55	70·60	59·12	74·91	62·0	66·12
September ,,	63·80	65·79	62·90	65·44	58·24	73·0	54·99	64·51	43·50	65·90	92·85	63·99	68·81
October ,,	...	66·50	69·11	66·85	73·44	62·73	46·41	56·77	61·0	54·05	74·84	73·71	64·27
November ,,	48·66	61·87	70·0	64·70	62·79	63·73	48·62	57·0	58·0	54·84	64·0	...	59·60
December ,,	62·60	69·85	65·33	63·12	64·41	63·17	46·73	60·65	50·66	59·95	61·53	...	59·23
January, 1902	60·0	66·11	75·26	76·69	77·0	61·86	54·68	68·12	55·50	63·53	68·57	...	66·97
February ,,	64·41	69·70	71·52	80·80	80·82	64·29	59·16	67·32	61·0	63·99	76·85	...	69·30
March ,,	44·35	63·12	74·01	77·19	80·35	71·78	54·0	67·75	56·33	60·92	93·0	...	69·05
April ,,	64·0	63·27	71·0	75·53	71·24	67·59	59·21	66·40	67·0	60·62	86·15	...	67·02
May ,,	114·0	58·29	73·56	76·28	74·85	65·16	55·44	67·78	64·0	62·03	58·55	...	64·30
June ,,	...	60·70	65·55	68·69	77·0	56·86	54·0	69·28	55·20	63·50	61·0	...	64·29
July ,,	43·41	60·66	67·60	61·16	72·0	58·66	50·0	62·13	30·0	62·78	53·0	...	58·0
Total ...	60·17	64·81	69·55	69·85	71·61	65·0	53·14	64·5	57·20	60·68	68·46	64·72	64·57

Period of Detention of "All Cases" and "Infecting Cases."

TABLE showing *for each hospital* the period of detention in weeks of "All Cases." (6)

	E. H.	S. E. H.	N. E. H.	W. H.	S. W. H.	N. W. H.	P. H.	B. H.	G. H.	F. H.	G. F H.	N. H.	Total.	Per-centage.
Under 2 weeks	...	...	...	...	...	2	6	...	1	6	...	...	15	·09
2 — 4	4	4	3	2	1	15	34	6	2	7	...	10	88	·56
4 — 6	19	48	28	28	8	46	434	102	11	134	10	107	975	6·28
6 — 8	38	152	444	225	269	224	1024	513	16	787	109	1269	5070	32·70
8 — 10	15	132	365	282	242	330	392	512	8	685	260	1444	4667	30·10
10 — 12	14	64	228	166	125	176	187	297	5	290	87	619	2258	14·56
12 — 14	14	30	258	115	103	67	71	109	...	128	36	291	1222	7·88
14 & over	6	51	152	105	127	61	67	108	4	84	21	420	1206	7·78
Total	110	481	1478	923	875	921	2215	1647	47	2121	523	4160	15,501	—

TABLE showing *for each hospital* the period of detention in weeks of "Infecting Cases." (7)

Period.	E. H.	S. E. H.	N. E. H.	W. H.	S. W. H.	N. W. H.	P. H.	B. H.	G. H.	F. H.	G. F. H.	N. H.	Total.
2 to 4 weeks	...	...	...	...	...	1	1	...	1	...	...	...	3
4 — 6 ...	1	3	2	2	1	...	22	6	1	1	1	1	41
6 — 8 ...	2	10	13	5	10	7	58	29	1	22	1	51	209
8 — 10 ...	1	4	11	14	14	25	17	24	...	31	5	64	210
10 — 12 ...	2	5	10	9	5	6	16	15	1	16	5	22	112
12 — 14 ...	1	...	6	2	2	1	4	9	1	5	...	3	34
14 & over ...	3	1	6	1	5	6	2	5	3	5	...	7	44
Total ...	10	23	48	33	37	46	120	88	8	80	12	148	653

TABLE showing the period of detention of "Infecting Cases" as compared with "All Cases." Period—from August 1901 to July, 1902. (8)

	Under 2 weeks.	— 4	— 6	— 8	— 10	— 12	— 14	— 16	Over 16	TOTAL.
Infecting Cases ...	—	3	41	209	210	112	34	24	20	653
Percentage ...	—	·15	6·27	32·06	32·15	17·13	5·20	3·67	3·06	
								6·73		
All Cases	15	88	975	5070	4667	2258	1222	1206		15,501
Percentage ...	·09	·56	6·28	32·70	30·10	14·56	7·88	7·78		

TABLE showing the period of detention of "Infecting Cases" as compared with "All Cases" detained under 8 weeks, 8 to 12, and 12 and over. (9)

	Under 8 weeks.	8 to 12 weeks.	12 weeks and over.
Infecting Cases... ...	38·74	49·31	11·94
All Cases	39·66	44·67	15·66

TABLE showing the period of detention of "Infecting Cases" as compared with "All Cases" detained under 10 weeks and over 10 weeks. (10)

	Under 10 weeks.	Over 10 weeks.
Infecting Cases	70·90	29·09
All Cases	69·76	30·23

TABLE showing the percentage of "Infecting Cases" on the number of patients discharged at each of the following periods. (11)

Period of Detention.	No. of Discharges.	No. of Infecting Cases.	Percentage.
Under 2 weeks	15	3	2·9
2 weeks and under 4 ...	88		
4 ,, 6 ...	975	41	4·20
6 ,, 8 ...	5,070	209	4·12
8 ,, 10 ...	4,667	210	4·49
10 ,, 12 ...	2,258	112	4·96
12 ,, 14 ...	1,222	34	2·78
14 and over	1,206	44	3·64
Total	15,501	653	4·2

TABLE showing the percentage of "Infecting Cases" on the number of patients discharged under 8 weeks, 8 to 12 weeks, and after a detention of 12 and over. (12)

Period of Detention.	No. of Discharges.	No. of Infecting Cases.	Percentage.
Under 8 weeks	6148	253	4·1
8 to 12 weeks	6925	322	4·6
12 weeks and over	2428	78	3·2
Total	15,501	653	4·2

TABLE showing *for each hospital* the period of detention of *" Infecting Cases " as compared with " All Cases," also the percentage of Infecting Cases on the number of discharges at each period. *August, 1901 to July, 1902.* (13)

Period.	E.H.	S. E. H.	N. E. H.	W. H.	S. W. H.	N.W. H.	P. H.	B. H.	G. H.	F. H.	G. F. H.	N. H.	Total.
Under 8 weeks.													
All cases	61	204	475	255	278	287	1498	621	30	934	119	1386	6148
Percentage of ditto	...	42·41	32·13	27·62	31·77	31·16	67·62	37·70	...	44·03	22·75	33·31	39·66
Infecting cases	3	13	15	7	11	8	81	35	3	23	2	52	253
Percentage of ditto	...	56·5	31·25	21·21	29·7	17·3	67·5	39·7	...	28·7	16·6	35·1	38·7
Percentage of infecting cases on discharges	...	6·3	3·1	2·7	3·9	2·7	5·4	5·6	...	2·4	1·6	3·7	4·1
8 to 12 weeks.													
All cases	29	196	593	448	367	506	579	809	13	975	347	2063	6925
Percentage of ditto	...	40·74	40·12	48·53	41·95	54·94	26·14	49·11	...	45·94	66·34	49·59	44·67
Infecting cases	3	9	21	23	19	31	33	39	1	47	10	86	322
Percentage of ditto	...	39·1	43·7	69·69	51·3	67·3	27·5	44·3	...	58·7	83·3	58·1	49·3
Percentage of infecting cases on discharges	...	4·5	3·5	5·1	5·2	6·1	5·6	4·8	...	4·8	2·8	4·1	4·6
12 weeks and over.													
All cases	20	81	410	220	230	128	138	217	4	212	57	711	2428
Percentage of ditto	...	16·83	27·74	23·83	26·28	13·89	6·23	13·17	...	9·99	10·89	17·06	15·66
Infecting cases	4	1	12	3	7	7	6	14	4	10	...	10	78
Percentage of ditto	...	4·3	25·0	9·09	18·9	15·2	5·0	15·9	...	12·5	...	6·7	11·9
Percentage of infecting cases on discharges	...	1·2	2·9	1·3	3·0	5·4	4·3	6·4	...	4·7	...	1·4	3·2
Percentage of infecting cases on total discharges... ...	...	4·7	3·2	3·5	4·2	5·0	5·4	5·3	...	3·7	2·2	3·3	4·2
Average period of detention ... (all cases)	...	64·81	69·55	69·85	71·61	65·0	53·14	64·5	...	60·68	64·72	68·46	64·57

* Infecting Cases—Groups A, B and C are included in this table.

TABLE showing *for each hospital* the period of detention of "Infecting Cases" as compared with All Cases, also the percentage of Infecting Cases on the number of discharges at each period. *"Infecting Cases" under sub-division group B excluded from this table.* See Charts II. and III. (14)

Period.	E. H.	S. E. H.	N. E. H	W. H.	S. W. H.	N. W. H.	P. H.	B. H.	G. H.	F. H.	G. F. H.	N. H.	Total.
Under 8 weeks.													
All cases	61	204	475	255	278	287	1498	621	30	934	119	1386	6148
Percentage of ditto... ...	...	42·41	32·13	27·62	31·77	31·16	67·62	37·70	...	44·03	22·75	33·31	39·66
Infecting cases	3	7	9	6	9	6	66	25	1	18	2	39	191
Percentage of ditto... ...	...	43·7	26·4	22·2	31·0	16·2	67·3	36·2	...	26·8	22·2	36·1	37·5
Percentage of infecting cases on discharges at each period	...	*3·4*	*1·8*	*2·3*	*3·2*	*2·0*	*4·4*	*4·0*	...	*1·9*	*1·6*	*2·8*	*3·1*
8 to 12 weeks.													
All cases	29	196	593	448	367	506	579	809	13	975	347	2063	6925
Percentage of ditto... ...	...	40·74	40·12	48·53	41·95	54·94	26·14	49·11	...	45·94	66·34	49·59	44·67
Infecting cases	3	8	16	18	14	26	26	31	...	39	7	62	250
Percentage of ditto... ...	...	50·0	47·0	66·6	48·2	70·2	26·5	44·9	...	58·2	77·7	57·4	49·2
Percentage of infecting cases on discharges at each period	...	*4·0*	*2·6*	*4·0*	*3·8*	*5·1*	*4·4*	*3·8*	...	*4·0*	*2·0*	*3·0*	*3·6*
12 weeks and over.													
All cases	20	81	410	220	230	128	138	217	4	212	57	711	2428
Percentage of ditto... ...	...	16·83	27·74	23·83	26·28	13·89	6·23	13·17	...	9·99	10·89	17·06	15·66
Infecting cases	4	1	9	3	6	5	6	13	3	10	...	7	67
Percentage of ditto... ...	...	6·2	26·4	11·1	20·6	13·5	6·1	18·8	...	14·9	...	6·4	13·1
Percentage of infecting cases on discharges at each period	...	*1·2*	*2·1*	*1·3*	*2·6*	*3·9*	*4·3*	*5·9*	...	*4·7*	...	*·98*	*2·7*
Percentage of infecting cases on total discharges	...	3·3	2·3	2·9	3·3	4·	4·4	4·1	...	3·1	1·7	2·5	3·2
Average period of detention (all cases)	...	64·81	69·55	69·85	71·61	65·0	53·14	64·5	...	60·68	64·72	68·46	64·57
Average period of detention (infecting cases)	...	61·8	75·7	67·1	67·	69·6	53·8	64·3	...	65·2	64·4	63·4	63·51

The following Tables 15 to 19 are calculated from data given in Professor Simpson's report on return cases of Scarlet Fever.

TABLE showing the percentage of " infecting cases " on the number of discharges at each of the following periods.

ACUTE HOSPITALS. (15)

Period of Detention.	No. of Discharges.	No. of Infecting Cases. " A Cases " only	Percentage.
Under 4 weeks	11	...	—
4 weeks and under 6 ...	102	2	1·9
6 " 8 ...	680	7	1·
8 " 10 ...	989	15	1·5
10 " 12 ...	691	14	2·
12 " 15 ...	625	7	1·1
15 and over	236	6	2·5
Total	3334	51	1·5

TABLE showing the percentage of " infecting cases " on the number of patients discharged under 8 weeks, 8 to 12 and 12 and over. (16)

Period of Detention.	No. of Discharges.	No. of Infecting Cases. " A Cases " only.	Percentage.
Under 8 weeks	793	9	1·1
8 to 12 weeks	1680	29	1·7
12 weeks and over	861	13	1·3
Total	3334	51	1·5

TABLE showing the period of detention of "Infecting Cases" as compared with "All Cases" detained under 8 weeks, 8 to 12, and 12 and over.

ACUTE HOSPITALS.

(17)

	Under 8 weeks.	8 to 12 weeks.	12 weeks and over.
Infecting Cases ... (51)	9	29	13
Percentage ...	17·6	56·8	25·4
All Cases ... ... (3334)	793	1680	861
Percentage ...	23·7	50·3	25·8

TABLE showing the period of detention of "Infecting Cases" as compared with "All Cases" detained under 10 weeks and over 10 weeks. (18)

	Under 10 weeks.	Over 10 weeks.
Infecting Cases ... (51)	24	27
Percentage ...	47·	52·9
All Cases ... ... (3334)	1782	1552
Percentage ...	53·4	46·5

TABLE showing the percentage of "Infecting Cases" calculated on the total number of discharges from the Acute hospitals, as compared with the Convalescent hospitals. (19)

Acute *v.* Convalescent Hospitals.

	Acute hospitals.	Convalescent hospitals.
Discharges ... (6507)	3334	3173
*Infecting cases ... (90)	51	39
Percentage ...	1·5	1·2

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* These 90 "infecting cases" consist of cases in which the evidence was so strong that there could be no doubt that they were the cause of the "return cases." They would therefore be equivalent to the cases I have classified under "Group A" in this report. See Table 25 in appendix, p. 164.

Northern Hospital Discharges.

Table showing the number of cases that were transferred from the Acute hospitals after a detention of under 4 weeks, under 6 weeks, and over 6 weeks. (20)

Period of detention in the Acute Hospital prior to transfer.	N. E. H.	N. W. H.	W. H.	S. W. H.	S. E. H.	F. H.	E. H.	Total.
Under 4 weeks								
No. of cases ...	1202	522	66	131	158	80	33	2192
Percentage of ditto	85·6	36·9	13·12	60·3	49·3	35·2	42·3	52·6
Under 6 weeks								
No. of cases ...	1388	1155	348	206	264	151	67	3586
Percentage of ditto	98·9	81·7	69·1	94·9	82·5	69·6	85·8	86·2
Over 6 weeks								
No. of cases ...	15	257	155	11	56	69	11	574
Percentage of ditto	1·1	18·3	30·9	5·1	17·5	30·4	14·2	13·8

Table showing the percentage of Infecting Cases on the number of patients discharged from the *Northern Hospital.* The cases are grouped under the hospital from which they were transferred and according to the period they were detained in the Acute Hospital prior to transfer.

(Group " B " infecting cases are not included in this table). (21)

Period of detention in Acute Hospital.	N. E. H.	N. W. H.	W. H.	S. W. H.	S. E. H.	F. H.	E. H.	Total.
Under 6 weeks.								
Discharges	1388	1155	348	206	264	158	67	3586
Infecting cases ...	34	31	12	6	4	1	4	92
Percentage of ditto on discharges	2·4	2·6	3·4	2·9	1·5	·6	5·9	2·5
Over 6 weeks.								
Discharges	15	257	155	11	56	69	11	574
Infecting cases ...	...	5	4	...	1	5	1	16
Percentage of ditto on discharges	...	1·9	2·5	...	1·7	7·2	9·	2·7
Percentage of infecting cases on total discharges	2·3	2·5	3·1	2·7	1·5	2·6	6·4	2·5

Table showing the average period of detention of scarlet fever patients discharged from the Northern Hospital. The Cases are grouped according to the Hospital from which they were transferred. (22)

Hospital.	No. of Cases Discharged.	Average Period of Detention.			Percentage of Infecting Cases. (B Cases Excluded.)	Percentage of Total Cases Discharged from the Northern Hospital.
		Acute Hospital.	Convalescent Hospital.	Total.		
Eastern	78	31·10	30·19	61·29	6·4	1·8
North-Eastern ...	1403	18·72	47·52	66·24	2·3	33·7
North-Western ...	1412	33·81	35·45	69·26	2·6	33·9
Western	503	40·05	36·63	76·68	3·1	12·
South-Western ...	217	26·84	35·31	62·15	2·7	5·2
South-Eastern ...	320	30.76	39·37	70·13	1·5	7·6
Fountain	227	37·32	26·0	63·32	2·6	5·4

Acute *v.* Convalescent Hospitals.

Table showing the relative period of detention of "Infecting Cases" and "All Cases," also the percentage of "Infecting Cases" on the number of discharges at each period in the Acute as compared with the Convalescent Hospitals. ("B" cases excluded.) (23)

	Acute Hospitals.	Convalescent Hospitals.
Under 8 weeks.		
All cases	4643	1505
Percentage of ditto	42·92	32·13
Infecting cases	150	41
Percentage of ditto	38·36	35·97
Percentage of infecting cases on discharges	*3·2*	*2·7*
8 to 12 weeks.		
All cases	4515	2410
Percentage of ditto	41·73	51·46
Infecting cases	181	69
Percentage of ditto	46·29	57·88
Percentage of infecting cases on discharges	*4·0*	*2·8*
12 weeks and over.		
All cases	1660	768
Percentage of ditto	15·34	16·39
Infecting cases	60	7
Percentage of ditto	15·34	6·14
Percentage of infecting cases on discharges	*3·6*	*·91*
Percentage of infecting cases on total discharges ...	3·6	2·5
Average period of detention (all cases)	63·07	68·04

Table showing for each hospital the average period of detention of scarlet fever patients discharged since 1899.

ACUTE HOSPITALS. (24)

Hospital.	1899.	1900.	1901.	1902.	Increase or Decrease since 1899.
Eastern	72·3	68·4	50·9	49·4	−22·9
North-Eastern	69·2	69·	65·6	67·6	− 1·6
North-Western	63·8	58·5	63·	65·6	+ 1·8
Western	81·6	74·4	69·	68·	−13·6
South-Western	69·8	68·3	68·3	74·3	+ 4·5
Fountain	67·7	70·6	60·7	62·	− 5·7
Grove	53·	63·2	65·7	51·8	− 1·2
South-Eastern	66·3	64·2	67·5	63·	− 3·3
Park	62·3	68·1	52·2	53·5	− 8·8
Brook	80·1	72·5	66·1	63·7	−16·4
* Average period of detention at the Acute Hospitals	70·4	68·6	62·4	62·6	− 7·8

CONVALESCENT HOSPITALS.

Northern	76·4	80·2	73·	67·5	− 8·9
Gore Farm	78·6	79·8	80·1	Smallpox	—
Average period of detention at the Convalescent Hospitals	77·4	80·	74·6	67·5	- 9·9

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* The average period of detention of scarlet fever patients in 1903 was at the Acute Hospitals 61·3 days, and at the Convalescent Hospital 76·9 days.

SCARLET FEVER.

INFECTING CASES.

Condition present after discharge.

Tables 25 to 34.

Age distribution of Infecting Cases.

Tables 34a and 34b.

"INFECTING CASES."

Classification of "Infecting Cases" under Groups A, B and C. (25)

	A	B	C
	Infecting Cases.	Not Infecting Cases.	Doubtful Infecting Cases.
No. of cases (648)	*280	136	232
Percentage	43·20	20·98	35·80

* The "A" Cases, calculated on the 16,702 discharges, is equivalent to 1·6 per cent. Professor Simpson's 90 "A" Cases to 1·3 per cent. See Table 19. Appendix.

"*Infecting cases.*"—("A" cases only).—Morbid condition present on or after discharge.

(26)

	Morbid condition of Nose.			Morbid condition of Throat.	Enlarged Glands.	Desquamation.	Affections of Skin or Scalp.	Otorrhœa.	Post Pharyngeal Catarrh.	No Morbid condition.
	Rhinorrhœa.	Rhinitis.	Nasal Catarrh.							
"Infecting cases" ... (280)	96	69	46	111	82	47	49	35	17	11
Percentage	75·35			39·64	29·28	16·78	17·50	12·50	6·07	3·92

Infecting Cases.—Classification under Groups A, B and C of the various morbid conditions present on or after discharge. (27)

	Total No. of Cases.	Infecting Cases.	Not Infecting Cases.	Doubtful Infecting Cases.
		A.	B.	C.
Purulent Rhinorrhœa.				
No. of cases	121	96	3	22
Percentage	...	79·33	2·47	18·18
Rhinitis.				
No. of cases	121	69	7	45
Percentage	...	57·02	5·78	37·19
Non-Purulent Rhinorrhœa or Nasal Catarrh.				
No. of cases	96	46	16	34
Percentage	...	47·91	16·66	35·41
Total	338	211	26	101
Percentage	...	62·42	7·69	29·88
Morbid Throat.				
No. of cases	209	111	29	69
Percentage	...	53·11	13·87	33·01
Enlarged Glands.				
No. of cases	145	82	14	49
Percentage	...	56·55	9·64	33·8
Desquamation.				
No. of cases	94	47	13	34
Percentage	...	50·	13·82	36·17
Affections of Skin and Scalp. (Including Impetigo and Eczema).				
No. of cases	94	49	11	34
Percentage	...	52·12	11·70	36·17
Otorrhœa.				
No. of cases	54	35	7	12
Percentage	...	64·81	12·96	22·22
Post Nasal Discharge.				
No. of cases	23	17	1	5
Percentage	...	73·91	4·34	21·74
Eczema and Impetigo Cases only.				
No. of cases	56	36	3	17
Percentage	...	64·29	5·35	30·35

Infecting Cases.—The period of detention of **Otorrhœa Cases** classified under Groups A, B & C. (28)

Period.	A. Infecting Cases.	B. Not Infecting Cases.	C. Doubtful Infecting Cases.	Total.	Percentage on "All Cases" discharged at each period.
Under 8 weeks. No. of cases	5	1	3	9	·14
8 to 12 weeks. No. of cases	18	2	5	25	·36
12 weeks and over. No. of cases	12	4	4	20	·82
Total	35	7	12	54	·34

Infecting Cases.—The period of detention of **Purulent Rhinorrhœa Cases** classified under Groups A, B & C. (29)

Period.	A. Infecting Cases.	B. Not Infecting Cases.	C. Doubtful Infecting Cases.	Total.	Percentage on "All Cases" discharged at each period.
Under 8 weeks. No. of cases	26	...	10	36	·58
8 to 12 weeks. No. of cases	52	3	7	62	·89
12 weeks and over. No. of cases	18	...	5	23	·94
Total	96	3	22	121	·78

Park Hospital.—Period of detention of patients ("All Cases") discharged with Otorrhœa. (30)

Period.	No. of Cases.
4 to 6 weeks	6
6 to 8 weeks	30
8 to 10 weeks	32
10 to 12 weeks	29
12 to 14 weeks	12
14 weeks and over	14
Total	123
Percentage on total discharges from the Park Hospital	5·55
Average period of detention (in days)...	70·21

Park Hospital.—Period of detention of patients discharged with *Otorrhœa* as compared with "*All Cases*" from the same hospital. (31)

Period.	
Under 8 weeks	
Otorrhœa Cases...	36
Percentage of total	29·26
All Cases.—Percentage of total	67·62
8 to 12 weeks	
Otorrhœa Cases	61
Percentage of total	49·59
All Cases.—Percentage of total	26·14
12 weeks and over	
Otorrhœa Cases	26
Percentage of total	21·13
All Cases.—Percentage of total	6·23

Infecting Cases.—The period of detention of cases that developed Otorrhœa for the first time after the discharge from hospital, classified under Groups A, B, and C. (32)

Period.	A Infecting Cases.	B Not Infecting Cases.	C Doubtful Infecting Cases.	Total	Percentage on "All Cases" Discharged at each period.
Under 8 weeks.					
No. of cases ...	3	1	3	7	·11
8 to 12 weeks.					
No. of cases ...	10	2	1	13	·18
12 weeks and over.					
No. of cases ...	—	1	—	1	·04
Total ...	13	4	4	21	·13

Infecting Cases.—Classification under Groups A, B and C of cases with (1) no Morbid condition on or after discharge, and (2) cases with only one Morbid condition. (33)

	Total No. of Cases.	Infecting Cases.	Not Infecting Cases.	Doubtful Infecting Cases.
		A	B	C
Rhinorrhœa.				
No. of cases	45	31	1	13
Percentage	...	68·88	2·22	28·88
Rhinitis.				
No. of cases	45	23	4	18
Percentage	...	51·1	8·88	40·
Nasal Catarrh.				
No. of cases	24	10	5	9
Percentage	...	41·66	20·83	37·5
Total	114	64	10	40
Percentage	...	56·14	8·77	35·08
Morbid Throat.				
No. of cases	36	9	11	16
Percentage	...	25·	30·55	44·44
Enlarged Glands.				
No. of cases	7	2	3	2
Percentage	...	28·57	42·85	28·57
Desquamation.				
No. of cases	24	8	7	9
Percentage	...	33·33	29·16	37·50
Affections of Skin and Scalp. (Including Impetigo and Eczema.)				
No. of cases	12	1	5	6
Percentage	...	8·33	41·66	50·
Otorrhœa.				
No. of cases	10	3	3	4
Percentage	...	30·	30·	40·
No Morbid Condition.				
No. of cases	125	11	66	48
Percentage	...	8·8	52·8	38·4

Infecting Cases.—Period of detention of cases with (1) no Morbid condition on or after discharge and (2) cases with only one Morbid condition. (34)

	Under 8 weeks.			Over 8 weeks.			Total.	Average period of detention in Hospital.
	A.	B.	C.	A.	B.	C.		
No Morbid Condition.								
No. of cases ...	5	31	22	6	35	26	125	59·35
Percentage ...	4·	24·8	17·6	4·8	28·	20·8		
Morbid Condition of Nose only.								
No. of cases ...	17	3	17	45	7	25	114	66·28
Percentage ...	14·91	2·63	14·91	39·47	6·14	21·92		
Desquamation.								
No. of cases ...	5	4	5	3	3	4	24	58·21
Percentage ...	20·83	16·66	20·83	12·50	12·50	16·66		
Morbid Throat only.								
No. of cases ...	7	5	61	2	7	9	36	60·72
Percentage ...	19·41	13·88	16·66	5·55	19·44	25·		

Age Distribution of "Infecting Cases."

TABLE showing the age distribution of "Infecting Cases" as compared with "All Cases."

(34A)

Age period in years.	Under 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 and over.
Infecting cases (648)	4	22	26	60	100	307	87	24	9	9
Per cent.	·06	3·30	4·01	9·25	15·43	47·37	13·42	3·70	1·38	1·38
"All Cases" (29,042)	1·07	3·80	7·18	9·41	10·57	38·28	16·24	6·68	3·56	3·14

Infecting Cases.—TABLE showing the age distribution of "Infecting Cases" as compared with "All Cases." Also the age distribution of each of the following morbid groups. (34B)

Age Period.	0 to 5 Years.	5 to 10 Years.	10 Years and over.
All Cases.			
No. of cases (29,042) ...	9,308	11,119	8,615
Percentage of ditto... ...	32·05	38·28	29·66
Infecting Cases.			
No. of cases (648)	212	307	129
Percentage of ditto... ...	32·71	47·37	19·90
	INFECTING	CASES.	
Morbid Affections of the Nose.			
No. of cases (338)	123	170	45
Percentage of ditto... ...	36·39	50·29	13·31
Morbid Throat.			
No. of Cases (209)	76	102	31
Percentage of ditto... ...	36·36	48·80	14·83
Desquamation.			
No. of cases (94)	25	41	28
Percentage of ditto... ...	26·59	43·61	29·78
Otorrhœa.			
No. of cases (54)	31	22	1
Percentage of ditto... ...	57·40	40·74	1·85

SCARLET FEVER.

Mucous Discharges.

Tables 35 to 48.

TABLE showing *for each hospital* the proportion of patients transferred and discharged that suffered while in hospital from a Mucous Discharge.* (35)

Cases that suffered from a Mucous Discharge.					"All Cases."	
					Transfers	Discharges.
Hospital.	No. of Cases.	Percentage on Admissions.	Cases Transferred.	Cases Discharged.	Percentage that suffered from Mucous Discharge.	Percentage that suffered from Mucous Discharge.
South-Eastern ...	114	12·2	41	73	7·7	15·1
North-Eastern ...	201	7·2	55	146	4·4	9·8
Western	237	17·1	78	159	16·5	17·2
South-Western...	109	8·7	8	101	·3	11·5
North-Western...	183	7·5	44	139	3·2	15·
Park	286	12·6	4	282	5·3	12·7
Brook	210	12·	—	210	—	12·8
Fountain ...	279	11·2	20	259	4·7	12·2

Table showing *for each hospital* the number of cases that suffered from a Mucous Discharge and the percentage that were discharged. (36)

Hospital.	No. of Cases that suffered from a Mucous Discharge.	No. of Cases Discharged that suffered while in hospital from a Mucous Discharge.	Percentage Discharged.
S. E. H. ...	114	73	64·1
N. E. H. ...	201	146	72·7
W. H.	237	159	67·1
S. W. H. ...	109	101	92·7
N. W. H. ...	183	139	76·0
P. H.	286	282	98·6
B. H.	210	210	100·
F. H.	279	259	92·9
Total ...	1,619	1,369	83·8

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* In Tables 35 to 42 the mucous discharge lasted for a period of one month or longer.

Table showing for the *Brook, Park and Fountain Hospitals* the number and percentage of cases discharged that suffered while in hospital from a Mucous Discharge. (37)

Month.	No. of cases Discharged.	No. of cases Discharged that suffered from a Mucous Discharge while in Hospital.	Percentage.
August, 1901 ...	371	25	6·7
September ...	517	73	14·1
October	602	53	8·8
November ...	652	61	9·3
December ...	581	67	11·5
January, 1902 ...	601	72	11·9
February ...	443	56	12·6
March	529	62	11·7
April	444	80	18·
May	434	54	12·4
June	328	69	21·
July	481	79	16·4
	5,983	751	12·5

Quarterly return of the above table. (38)

August to October, 1901	1,490	151	10·1
November, 1901, to January, 1902 ...	1,834	200	10·9
February to April	1,416	198	13·9
May to July	1,243	202	16·2
	5,983	751	12·5

Northern Hospital.—Table showing the number of patients discharged each month from the Northern Hospital, and the number and percentage of the same that suffered from a Mucous Discharge while in Hospital. (39)

Month.	Total No. of Discharges.	No. of Cases that Suffered from a Mucous Discharge in Hospital.	Percentages on the Number of Discharges.			
August, 1901 ...	389	32	8·22	8·60	6·02	5·74
September ...	292	24	8·21			
October	526	48	9·12			
November ...	608	34	5·59	4·06		
December ...	419	14	3·34			
January, 1902 ...	571	17	2·95			
February ...	185	20	10·81	13·16	5·16	
March	93	16	17·20			
April	41	6	14·63			
May	279	3	1·08	2·70		
June	294	8	2·72			
July	463	17	3·67			
	4,160	*239	5·74			

*Average Period of Detention ... ... 111·97 days.

Quarterly return showing (1) the number of patients discharged from the Northern Hospital (2) the percentage that suffered from a Mucous discharge while in hospital, (3) the percentage of Infecting Cases, and (4) the average period of detention in days. (40)

Period.	No. of cases Discharged.	Percentage that suffered from Mucous discharge.	Percentage of Infecting Cases calculated on the number of cases discharged in each period.	Average Period of detention (in days). "AllCases."
August to October, 1901	1,207	8·60	2·23	*79·25*
November, 1901, to January, 1902	1,598	4·06	4·31	*65·*
February to April, 1902	319	13·16	2·50	*82·86*
May to July, 1902	1,036	2·70	3·37	*56·83*
Totals	4,160	5·74	3·31	68·46

TABLE showing for the *Acute* and for the *Northern Hospitals* separately, the number of patients discharged each month, and the percentage that were subsequently associated with the illness of Return Cases. (41)

Month.	Discharges from Acute Hospitals.	Discharges from Northern Hospital.	Infecting Cases at Acute Hospital.	Infecting Cases at Northern Hospital.	Percentage of Infecting Cases at Acute Hospital.	Percentage of Infecting Cases at Northern Hospital.
August 1901 ...	732	389	31	5	4·23	1·28
September ,, ...	911	292	26	5	2·85	1·71
October ,, ...	942	526	38	17	4·03	3·23
November ,, ...	974	608	52	33	5·33	5·42
December ,, ...	903	419	62	21	6·86	5·01
January, 1902 ...	1,062	571	50	24	4·70	4·20
February ,, ...	925	185	51	6	5·51	3·24
March ,, ...	1,139	93	57	1	5·	1·07
April ,, ...	934	41	44	1	4·71	2·43
May ,, ...	810	279	28	10	3·45	3·58
June ,, ...	645	294	23	8	3·56	2·62
July ,, ...	841	463	31	17	3·68	3·67
Total ...	10,818	4,160	493	148	4·55	3·31

Quarterly return showing (1) the number of patients discharged from the Acute Hospitals (2) the percentage that suffered from a Mucous Discharge while in hospital, (3) the percentage of Infecting Cases and (4) the average period of detention in days. (42)

Period.	Discharges.	Percentage that suffered from Mucous Discharge.	Percentage of Infecting Cases calculated on the number of cases discharged in each period.	Average Period of Detention (in days). "All Cases."
August to October, 1901... ...	2,585	11·70	3·67	*60·68*
November, 1901, to January, 1902	2,939	11·2	5·61	*60·63*
February to April, 1902... ...	2,998	13·2	5·07	*67·02*
May to July, 1902	2,296	14·8	3·57	*59·36*
Totals	10,818	12·7	4·55	63·07

Infecting Cases.—TABLE showing the number of patients discharged each month, and the number of Infecting Cases that suffered from a Mucous Discharge within two days after leaving Hospital. (43)

Month.	Discharges.	Infecting Cases that suffered from			Total.	Percentage of Discharges.
		Rhinorrhœa.	Nasal Catarrh or non-purulent Rhinorrhœa.	Otorrhœa.		
August, 1901 ...	1,275	9	2	...	11	·86
September ,, ...	1,502	8	4	1	13	·86
October ,, ...	1,538	4	7	2	13	·84
November ,, ...	1,582	10	12	4	26	1·64
December ,, ...	1,322	9	9	4	22	1·66
January, 1902 ...	1,633	7	8	5	20	1·22
February ,, ...	1,110	12	4	4	20	1·80
March ,, ...	1,232	15	5	7	27	2·19
April ,, ...	975	6	2	4	12	1·23
May ,, ...	1,089	3	1	6	10	·91
June ,, ..	939	3	...	2	5	·53
July ,, ...	1,304	7	...	1	8	·61
	15,501	93	54	40	187	1·20

Infecting Cases.—TABLE showing the number of cases that suffered from morbid affections of the Nose and Otorrhœa and the day after discharge the morbid condition was first observed by the friends of the discharged patients. (44)

	Day of Discharge.	Days after discharge.									Total.
		1	2	3	4	5	6	7	8 days and over.	Doubtful	
Affections of the Nose.											
Rhinorrhœa ...	56 46·28	26 21·48	11 9·09	6 4·95	3 2·47	1 ·82	3 2·47	3 2·47	5 4·13	7 5·78	
Rhinitis ...	63 52·06	11 9·09	5 4·13	... ...	... ...	1 ·82	2 1·65	3 2·47	4 3·30	32 26·44	121
Nasal Catarrh	45 46·87	7 7·29	2 2·08	4 4·16	1 1·04	... ...	2 2·08	2 2·08	6 6·25	27 28·12	96
Total No. of Cases ... Percentage ...	164 48·52	44 13·	18 5·32	10 2·96	4 1·18	2 ·59	7 2·07	8 2·36	15 4·43	66 19·52	338
Otorrhœa ... Percentage ...	22 40·74	11 20·37	7 12·96	2 3·70	1 1·85	... ...	1 1·85	2 3·70	5 9·25	3 5·55	54

Comparative table showing (1) the number of patients discharged that suffered from a Mucous Discharge while in hospital, (2) the number of "Infecting Cases" that suffered from a Mucous Discharge within two days after leaving Hospital, and (3) the number of "Infecting Cases" that occurred within the same quarterly periods.

ALL HOSPITALS. (45)

Period.	"All Cases" discharged.	Patients discharged that suffered from Mucous Discharges while in Hospital. Percentage on "All Cases" Discharged.	"Infecting Cases" that suffered from Mucous Discharges within 2 days after leaving Hospital Percentage on "All Cases" Discharged.	"Infecting Cases." Percentage on "All Cases" Discharged.	Average period of detention in days of "All Cases."
Aug. to Oct., 1901 ...	4315	10·59	·85	3·1	66·41
Nov., 1901, to Jan., 1902	4537	8·75	1·49	5·3	62·14
Feb. to April, 1902 ...	3317	10·18	1·77	4·8	68·53
May to July, 1902 ...	3332	11·10	·69	3·5	61·56
Total	15,501	10·72	1·20	4·1	64·57

Comparative table showing (1) the number of "All Cases" discharged that suffered from a Mucous Discharge while in hospital, (2) the number of "Infecting Cases" that suffered from Mucous Discharge within two days after leaving hospital, and (3) the number of "Infecting Cases" that occurred within the same quarterly periods.

THE PARK, BROOK AND FOUNTAIN HOSPITALS. (46)

Period.	"All Cases" Discharged.	Cases that suffered from Mucous Discharge while in hospital Percentage on "All Cases" discharged.	"Infecting Cases" that suffered from Mucous Discharge within two days after leaving hospital. Percentage on "All Cases" discharged.	"Infecting Cases." Percentage on "All Cases" discharged.	Average period of detention in days of "All Cases."
Aug. to Oct., 1901 ...	1490	10·1	1·34	4·16	57·79
Nov., 1901, to Jan., 1902	1834	10·9	2·29	5·83	56·18
Feb. to April	1416	13·9	3·24	5·57	61·82
May to July	1243	16·2	1·12	3·21	60·67
Total	5983	12·5	2·03	4·81	58·85

"All Cases."—TABLE showing the *Age Incidence* of cases that suffered from **Otorrhœa** during their stay in hospital.

PARK HOSPITAL. (47)

Age period.	Number of Cases.		Total.
	Recovered before discharge.	Discharged with same.	
Under 1 year ...	1	4	5
1 — 2	13	9	22
2 — 3	47	18	65
3 — 4	53	24	77
4 — 5	62	23	85
0 — 5	176	78	254
5 — 10	171	37	208
10 — 15	46	5	51
15 — 20	17	3	20
20 and over ...	3	—	3
	413	123	536

"All Cases."—TABLE showing (1) the age distribution of cases that suffered from Otorrhœa during their stay in hospital, and (2) the age distribution of cases that suffered from Otorrhœa at the time of discharge from hospital.

PARK HOSPITAL. (48)

Age period.	Under 5.	5 — 10	10 and Over.
Otorrhœa Cases.			
No. of Cases (536)...	254	208	74
Percentage	47·3	38·8	13·8
Cases discharged with Otorrhœa			
No. of Cases (123)...	78	37	8
Percentage	63·4	30·	6·5

RETURN CASES OF SCARLET FEVER.

Age Distribution. Tables 49 to 52.

Case Fatality. Tables 53 to 60.

RETURN CASES. AGE DISTRIBUTION.

Return Cases.—TABLE showing age distribution of *Return Cases* as compared with *All Cases.* (49)

Age periods ..	Under 1	1–2	2–3	3–4	4–5	5–10	10–15	15–20	20–25	25–30	30–35	35–40	40–45	45–50	50 & over.
"Return cases" (930)	16	48	97	85	109	338	144	46	14	12	14	4	2	...	1
Percentage of ditto ...	1·73	5·26	10·43	9·13	11·72	36·35	15·48	4·94	1·50	1·29	1·50	·43	·21	...	·10
"All cases" ... (29,042)	313	1106	2086	2733	3070	11119	4729	1941	1034	506	239	92	41	21	12
Percentage of ditto ...	1·07	3·80	7·18	9·41	10·56	38·28	16·24	6·68	3·56	1·74	·82	·31	·10	·07	·04

(50)

Age periods	0–5	–10	10 and over.
Return cases ... ... (930)	355	338	237
Percentage of ditto ...	38·17	36·34	25·48
All cases ... .. (29,042)	9308	11,119	8615
Percentage of ditto .	32·05	38·28	29·66

TABLE showing age distribution of the susceptible children in the families in which return cases occurred, and the number that were attacked before and after the return from hospital of the infecting cases. (51)

Age period		Under 1 year.	-2	-3	-4	-5	5-10	-15	15 and over.	Total.
No. of susceptible children		154	142	198	208	265	893	459	263	2582
Primary cases	Attacked about the same time as infecting case	...	4	2	7	8	35	17	1	74
	Infecting cases...	4	21	24	58	97	293	87	36	620
Secondary cases		...	4	3	6	6	13	6	5	43
Return cases		14	47	96	85	103	317	132	58	852
Susceptible children not attacked		66	136	73	52	51	235	217	163	993

TABLE showing the age distribution of the *Primary and Secondary* Cases as compared with the "*Return Cases.*" (52)

Age period.	0-5	5-10	10 and over.
Primary and Secondary Cases (737) ...	244	341	152
Percentage of ditto...	33·10	46·25	20·62
"Return Cases" ... ... (852)	345	317	190
Percentage of ditto...	40·49	37·20	22·30

RETURN CASES. CASE FATALITY.

Table showing Case fatality of "Return Cases" as compared with "All Cases."

(53)

	Under 1 year.	-2	-3	-4	-5	5-10	-15	-20	-25	-30	-35	-40	-45	-50	55 and over.	Total.
Return Cases	16	48	97	85	109	338	144	46	14	12	14	4	2	...	1	930
Deaths ...	2	5	12	13	6	11	...	2	...	...	3	...	...	...	...	54
Case fatality	12·5	10·4	12·3	15·2	5·5	3·2	...	4·3	...	...	21·4	...	...	...	...	5·8
All Cases ... (1901-1902)	313	1105	2086	2733	3070	11,119	4729	1941	1034	506	239	92	41	21	13	29,042
Deaths ...	48	130	221	198	113	234	43	26	27	6	4	3	...	...	1	1054
Case fatality	15·3	11·7	10·5	7·2	3·6	2·1	·9	1·3	2·6	1·1	1·7	3·2	...	...	7·6	3·6

(54)

Age periods ...	0-5	5-10	10 and over.	Total.
Return Cases ...	10·7	3·2	2·1	5·8
All Cases... ...	7·6	2·1	1·2	3·6

TABLE showing the period of detention of infecting cases, the number of the same at each period, that gave rise to dangerously ill (D. N.) return cases. (55)

Period of Detention.	Number of Infecting Cases.	No. of Infecting Cases that gave rise to "D. N." Return Cases.	Percentage.
Under 2 weeks... ...	...	...	...
2 weeks and under 4...	3	1	33·3
4 " 6...	41	7	17·07
6 " 8...	209	29	13·87
8 " 10...	210	41	19·52
10 " 12...	112	17	15·16
12 " 14...	34	8	23·5
14 and over	44	5	11·3
Total... ...	653	108	16·5

(56)

Period of Detention.	Under 8 weeks.	8–12 weeks.	12 weeks & over.
Infecting cases (653) ...	253	322	78
"D. N." Infecting cases (108)	37	58	13
Percentage	14·6	18·	16·6

(57)

Period of Detention.	Under 10 weeks.	10 weeks & over.
Infecting cases (653) ...	463	190
"D. N." Infecting cases (108)	78	30
Percentage	16·8	15·7

TABLE showing for each hospital the period of detention of Infecting Cases, and the number of the same that gave rise to dangerously ill (D.N.) Return Cases. (58)

Period of Detention	E.H.	S.E.H.	N.E.H.	W.H.	S.W.H.	N.W.H.	P.H.	B.H.	G.H.	F.H.	G.F.H.	N.H.	Total.
Under 8 weeks.													
Infecting Cases	3	13	15	7	11	8	81	35	3	23	2	52	253
D.N. Infecting Cases ...	...	1	1	...	3	...	16	6	...	2	...	8	37
Percentage ...	...	7·6	6·6	...	27·2	...	19·7	17·1	...	8·6	...	15·3	14·6
8 to 12 weeks.													
Infecting Cases	3	9	21	23	19	31	33	39	1	47	10	86	322
D.N. Infecting Cases ...	1	...	3	4	4	5	9	9	1	10	1	11	58
Percentage ...	...	...	14·2	17·3	21·0	16·1	27·2	23·0	...	21·2	10·0	12·7	18·0
12 weeks & over.													
Infecting Cases	4	1	12	3	7	7	6	14	4	10	...	10	78
D.N. Infecting Cases ...	...	...	1	1	1	...	4	3	...	1	...	2	13
Percentage ...	...	...	8·3	33·3	14·2	...	66·6	21·4	...	10·0	...	20·0	16·6
Total ...	...	4·3	10·4	15·1	21·6	10·8	22·4	20·4	...	16·2	8·3	14·1	16·5

Table showing in monthly periods the number of return cases admitted each month and the proportion that were dangerously ill on or after admission to hospital. (59)

Months the Return Cases occurred.	Return Cases.	"D. N" Cases.			Percentage.			Total No. of Infecting Cases. Average period of detention.
		Recovered.	Died.	Total.	Recovered.	Died	Total.	
June 1901	...	1	1	2	...	...	...	...
July ,,	36	3	3	6	8·61	8·61	16·66	...
August ,,	43	5	5	10	11·62	11·62	23·25	66·44
September ,,	66	8	...	8	12·12	...	12·12	64·92
October ,,	61	6	2	8	9·83	3·27	13·11	60·07
November ,,	105	4	6	10	3·80	5·71	9·52	59·75
December ,,	119	5	10	15	4·20	8·40	12·60	61·77
January 1902	110	7	7	14	6·36	6·36	12·72	61·84
February ,,	84	5	6	11	5·95	7·14	13·09	69·07
March ,,	86	3	6	9	3·48	6·93	10·04	65·41
April ,,	63	7	2	9	11·11	3·17	14·28	63·60
May ,,	60	7	2	9	11·66	3·33	15·	76·13
June ,,	46	2	2	4	4·34	4·34	8·68	59·83
July ,,	51	2	2	4	3·92	3·92	7·84	59·66
Total ...	930	64	53	117	6·98	5·80	12·58	...

Table showing the interval after admission that cases were notified to be dangerously ill. (60)

	On Admission.	Within the first week.	-2	-3	-4	-5	-6	Over 6 weeks.	Total.
No. of cases	25	76	11	7	11	6	2	4	117
Percentage on the total No. of return cases (930)	2·6	8·1	1·1	·75	1·1	·64	·21	·13	12·5

SCARLET FEVER.

Superadded Infectious Diseases.

Tables 61-63.

SUPERADDED DISEASES.

(64)

Table showing for each hospital the *period of detention* of patients (scarlet fever) that contracted a Superadded Infectious Disease in Hospital.

Period.	E. H.	S. E. H.	N. E. P.	W. H.	S. W. H.	N. W. H.	P. H.	B. H.	G. H.	F. H.	G. F. H.	N. H.	Total.
Under 8 weeks.													
No. of cases	...	9	7	4	5	14	42	4	...	23	...	1	109
Average period of detention (in days)	...	48·0	50·28	44·0	43·60	41·92	45·33	52·50	...	46·56	...	51·0	45·79
8 to 12 weeks.													
No. of cases	3	16	21	23	19	49	82	23	1	72	6	60	375
Average period of detention (in days)	69·66	71·50	70·85	74·30	69·63	68·40	70·93	70·78	66·0	69·47	72·66	72·98	70·94
12 to 14 weeks.													
No. of cases	2	3	39	21	16	10	20	7	...	21	4	57	200
Average period of detention (in days)	85·0	95·0	91·33	90·28	89·43	90·10	89·95	92·42	...	90·76	91·25	89·96	86·55
14 weeks and over.													
No. of cases	4	5	25	32	41	14	33	14	...	16	6	137	327
Average period of detention (in days)	140·0	111·2	114·76	119·18	137·58	117·92	118·60	132·28	...	112·31	106·16	130·08	125·72
Average period of detention of the total number (in days)	104·3	73·2	89·9	99·6	106·3	74·6	75·8	90·1	66·0	74·6	89·87	107·37	89·76

TABLE showing the number of superadded infectious diseases contracted at the acute hospitals, as compared with the convalescent hospitals. *Period—August, 1901 to July, 1902.*

PERCENTAGE ON ADMISSIONS. (62)

	Admissions.	Superadded Diseases contracted in Hospitals.	Percentage.
Acute Hospitals ...	15,562	782	5·25
Convalescent Hospitals	4351	229	5·26
Total	19,913	1011	5·07

TABLE showing the number of superadded infectious diseases contracted at the acute hospitals, as compared with the convalescent hospitals. *Period—August, 1901 to July, 1902.*

PERCENTAGE ON DISCHARGES. (63)

	Discharges.	Superadded Diseases Contracted in Hospital	Percentage.
Acute Hospitals ...	10,818	782	7·2
Convalescent Hospitals	4,683	229	4·89
Totals ...	15,501	1,011	6·52

No. ______

METROPOLITAN ASYLUMS BOARD.

______ **HOSPITAL,**

______

______ **190**

RETURN CASE—

Name ______
Address ______

Age ______
Sex ______
Date of admission ______
Date of onset of disease ______
Disease { Certified ______
Disease { Disease diag^d. in Hospital ______

PRIMARY CASE—

Name ______
Address to which discharged ______

Age ______
Sex ______
Disease { 1. Certified ______
Disease { 2. Diag^d. in Hospital ______
Mucous discharges while in Hospital (if any) { Ear ______
Mucous discharges while in Hospital (if any) { Nose ______
Do. Date of cessation in each case ______
Superadded infectious disease (if any) ______
Do. Date of onset ______
Date of discharge from Hospital ______
Number of days in Hospital ______

To Dr. A. G. R. CAMERON,
Medical Investigator.

______
Med. Supt.

Reference No. ______

METROPOLITAN ASYLUMS BOARD.

______ **HOSPITAL,**

______

______ **190**

RETURN CASE.

______

was admitted here on ______

from ______

suffering from ______

______

was, I understand, discharged to the same address

from the ______ Hospital,

on ______

______
Med. Supt.

To
The Clerk to the Board.

METROPOLITAN ASYLUMS BOARD.

______ **HOSPITAL,**

______

______ **190**

RETURN CASE.

Sir,

I am directed to report to you that ______

______

was admitted here on ______
from ______
suffering from ______

______

was discharged to the same address from the ______ Hospital

I understand, on ______

The circumstances will be investigated by one of the Medical Officers of the Board.

I am, Sir,
Your obedient servant,

______
Med. Supt.

To
The Medical Officer of Health.
for ______

*No.*______

METROPOLITAN ASYLUMS BOARD.

Investigation of Return Cases.

Date of Investigation______ **Group**______

Disease of Return case______ Disease of Primary case______

PRIMARY CASE.

Onset of illness______ day of the week______

Date of admission______

„ discharge______

Borough______

Name and age of Primary case______

Address______

Hospital admitted to______

„ discharged from______

No. of days in Hospital______

Parents' statement______

______

______

Sleeping arrangements______

______

Complications in Hospital______

Superadded disease______

Otorrhœa______

Rhinorrhœa______

Medical Examination______

Nose______ Culture______

Throat______ „ ______

Ears______ Eyes______ Glands______

Skin______

Scalp______

Health of family of Primary case______

______

Ages of children and fever history______

* Has had Fever. † Now ill with Fever. ‡ Not had Fever.

Source of infection of Primary case______

RETURN CASE.

Name and age of Return case ____________________

Address ____________________

Date and nature of initial symptoms ____________________

Date of rash (if any) ____________________

Hospital and date of admission ____________________

"Interval" ____________________

Name of school and date of last attendance ____________________

Plays ____________________ Works at ____________________

Previous cases in the house ____________________

,, ,, street ____________________

Health of family of Return case ____________________

____

Ages of children and fever history ____________________

HOUSEHOLD ARRANGEMENTS.

No. of rooms occupied by family of Primary case ____________________

No. of bedrooms ____________________

,, ,, occupied by family of Return case ____________________

New—not. Clean—not. Good repair—not Dry—Damp

Sanitary condition of premises ____________________

Back yard ____________________

No. of families in house ________ No. of rooms ________ No. of children ________

Sublet ________ Left in lodgings ________ Flat ________

DISINFECTION.

No. of days after onset of illness ____________________

No. of rooms disinfected ________ bed ________ living room ________ passages.

Room disinfected—(1) Room usually occupied by patient ____________________

(2) ,, into which he was moved after onset of illness ____________________

Method of disinfection ____________________

Re-papered—Yes. No. Distempered—Yes. No. Washed down—Yes. No.

No. of beds in disinfected room ________ No. disinfected ________

Nature of bed and bedding—

(1) Wire woven mattress and overlay __________

(2) Straw palliasse and mattress __________

(3) Box spring and feather bed __________

(4) Other varieties __________

baked _____ palliasse, _____ mattress, _____ overlay, _____ blankets, _____ quilts,

_____ sheets, _____ curtains. _____ carpets, _____ rugs, _____ cushions.

Bedding washed at home—Yes. No.

Clothes baked—Parents'—Yes. No.

Children's Best— Yes. No.

,, Everyday— Yes. No.

,, Sleeping garments— Yes. No.

Clothes worn day of onset of illness—Yes. No.

Clothes washed at home __________

,, "put out to air" __________

Where were clothes kept while Primary case was in Hospital? __________

Clothes worn on discharge __________

Toys __________

Remarks. __________

OBSERVATIONS

ON THE

REPORT

BY

THE MEDICAL SUPERINTENDENTS

OF THE

BOARD'S FEVER HOSPITALS.

PREFACE.

In compliance with the duty entrusted to us, we have carefully examined the report on return cases of scarlet fever and diphtheria from July 1st, 1901, to July 31st, 1902, prepared by Dr. A. G. R. Cameron. The report with its appendix bears witness to the energy and thoroughness of Dr. Cameron in collecting and arranging so large a mass of material.

In discussing his report we shall consider all the points raised by him, but not invariably in the same order, though we shall follow him in taking scarlet fever and diphtheria separately. A separate list at the end will include the errors we have detected, and the statements, the accuracy of which we feel compelled to call in question.

The investigation of return cases may be looked upon chiefly as an attempt to answer the following three questions:—

I. Was infection in the second case contracted from the primary case or not?

II. If some discharged patients are infectious, can any difference be shown to exist between the infecting and the non-infecting discharged patients?

III. Apart from the visible condition of the patient, are there any causes such as season of year, weather, variation in hospital routine, management (*e.g.* overcrowding) or methods of discharge, which have any influence on this late infectivity?

Dr. Cameron's report may be regarded as an attempt to answer these three questions and the subsidiary questions that arise from them.

Part I.

SCARLET FEVER.

(1) Were the return cases infected by the discharged patients or by other means?

688 infecting cases were reported to Dr. Cameron between 1st July, 1901, and 31st July, 1902.[1] As the result of his enquiries he considered that—

(A) 279 were probably infecting cases.

(C) 254 were doubtful, the return cases having possibly been infected from other sources.

(B) 155 were wrongly suspected of conveying the infection, since in his own words "the evidence conclusively showed that the 'return' cases were mere coincidences, and did not derive infection from the alleged infecting case."

If Dr. Cameron was justified in his opinion that the evidence was conclusive in 155 cases, then none of these cases should have been retained in the further discussion of the subject; and Dr. Cameron's course in having done so is calculated to mislead. We think, however, that his words "conclusively showed that the return cases were mere coincidences, and did not derive infection from the alleged 'infecting cases'" are not justified. No complete list of cases is given, but we cannot adopt his opinion, partly because of the facts he publishes as regards certain of the cases, and partly on general grounds.

In some instances the alleged infecting and return cases had never met, or only done so when the latter was already ill, or in the incubation stage of the disease. It is not probable, however, that this happened in many instances, and we fail to see how conclusive evidence can be obtained in other cases. The fact that in certain instances some article has escaped disinfection, or that the return case has come in contact with other scarlet fever patients, does not conclusively prove that infection was not derived from the alleged source. In particular, we cite cases 248 and 328 (Appendix pp. 132-133) included by Dr. Cameron in class B, on evidence which does not seem conclusive to us.

We consider that all cases where the evidence was really conclusive should have been excluded from every table, and that the grounds on which these cases were excluded should have been published. The remaining cases should have been classified thus:

(*a*) Return cases probably arising from the alleged infecting case.

(*b*) Return cases probably infected otherwise,

with further sub-division if warranted by the nature of the evidence.

(2) Can any difference be shown to have existed between the infecting and the non-infecting discharged patients?[2]

This is one of the most important parts of the whole enquiry, and Dr. Cameron's facts bearing upon it are chiefly set forth in tables 17, 19 and 21.[3] In table 27 of the appendix[4] the infecting cases of table 17 are split up into groups A, B and C.

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[1] Report, pp. 2 and 3.

[2] Report Chap. 7, pp. 13-21, also Appendix Tables 25-34 (pp 164-169).

[3] Pp. 13, 14, 15.

[4] P. 165.

In table 17[1], Dr. Cameron compares with the clinical condition found at the time of his visit in 648 alleged infecting cases, that noted on the bed cards at the time of discharge in 16,702 cases, being the whole number discharged during the period under investigation. To take a particular instance, he finds that an unhealthy nose was present in 3·55 per cent. of the latter group, and in 52·31 per cent. of the former. This great difference was chiefly due, without doubt, to the different conditions under which the observations were taken, in the one group before the patient had left the hospital, in the other, after he had been at home for a time varying from a few days up to several weeks. Dr. Cameron himself states that over 60 per cent. of the infecting cases which had rhinorrhœa developed that condition after they left the hospital.[2] This difference, therefore, in the time at which the observations were made vitiates the conclusions that might otherwise be drawn from table 17. It would be profitable to compare the notes made before discharge in the infecting cases with those made under the same conditions in the non-infecting cases, though this has not been done.

In table 19[3] Dr. Cameron compares the same figures as regards the infecting cases with the clinical condition found after discharge by Dr. Matthews in 478 non-infecting cases. Deductions drawn from this table are therefore more reliable than those from the former, but we think it unfortunate that the second group of cases was so small, and that the data upon which the table is based should have been collected by two different observers.[4] In this table it is shown that the incidence of the following conditions is higher among infecting than non-infecting cases, viz., morbid conditions of nose, affections of skin and scalp, otorrhœa, post nasal discharge and desquamation. In Dr. Cameron's opinion, the figures in regard to three of these, viz., desquamation, otorrhœa, and affections of the skin and scalp, may be explained by the common association of each of them with other complications, especially discharges from the nose. This opinion can only be proved in one way. To take desquamation, for example, it is necessary to find what proportion of infecting cases out of the whole number discharged has occurred in each of the following four groups :—

(a) Cases desquamating, with nasal discharge.

(b) Cases not desquamating, with nasal discharge.

(c) Cases desquamating, without nasal discharge.

(d) Cases not desquamating, without nasal discharge.

when, if Dr. Cameron's opinion were correct, the proportion in (a) and (b) would be high and approximately equal, and that in (c) and (d) low but approximately equal. Dr. Cameron, however, does not give the material from which these proportions can be calculated.

Dr. Cameron divides morbid conditions of the nose into three classes, of which he finds one—non-purulent rhinorrhœa—of less importance from the point of view of infection than the others We do not, however, believe that these three divisions can be established. Probably some cases that appear to have dry rhinitis or non-purulent rhinorrhœa, when seen on the first occasion, would be found to have a purulent rhinorrhœa, if seen a few days afterwards. We distrust any statistics founded on a division into these three classes.

In conclusion, we believe :—

(a) That patients with discharging or inflamed noses are more likely than any other class to cause infection.

(b) That many cases of nasal discharge occur for the first time after leaving hospital, and that these cannot be foreseen. Many of these are probably common colds, though they may facilitate infection.

(c) That late desquamation is not in itself evidence of infectivity.

(d) That infection is sometimes carried by discharged patients who are free from all evidence of scarlet fever or any of its sequelæ.

As regards (b) and (c), however, the evidence given is not yet conclusive. Even greater doubt attaches to the evidence brought forward by Dr. Cameron with regard to the possible non-infectivity of impetigo and of otorrhœa.

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[1] p. 13.

[2] Report p. 13 Compare also table 18 on the same page.

[3] p. 14.

[4] This point is more important than would be thought by anyone unacquainted with these cases Almost all symptoms present on discharge are very slight in degree, for cases are rarely discharged while they have marked symptoms, and what one observer might note as "slightly enlarged glands" another would take to be glands of normal size, and similarly with almost all the other symptoms mentioned in these two tables.

(3) Have any of the following causes exerted an influence upon the infectivity occurring among discharged patients?

A—PERIOD OF DETENTION.[1]

On this point the figures collected by Dr. Cameron, and set forth in table 7, furnish a conclusive answer. It is there shown that it is neither those patients who are discharged very soon, nor those who are detained exceptionally long, but those discharged after a medium period of detention who have furnished the greater proportion of infecting cases.

If we call the percentage which the infecting cases, occurring in any group of discharged patients, bear to the whole number of that group *the infectivity rate*, then the following table gives the infectivity rates for a total number of 15,501 patients, grouped according to the period of detention in hospital.

Table A.[2]

	Period of Detention in Weeks.						
	Under 4.[3]	4–6.	6—8.	8—10.	10—12.	12—14.	Over 14.
Infectivity rate ...	2·9	4·20	4·12	4·49	4·96	2·78	3·64

It may be as well to point out that these figures do not themselves express the true relationship between length of detention and infectivity after discharge. If cases were discharged indiscriminately at varying periods without any selection, the resulting infectivity rate in each group would show the effect of detention in hospital upon the persistence of infection after discharge. As, however, patients are discharged in all cases after careful selection, and only those sent home who at the time of examination are presumed to be free from infection, the above figures show only the proportion of patients in each group in which infection has lasted longer than was expected by the Medical Superintendent who discharged the case.

Since Dr. Cameron and many previous investigators have found that cases with discharge from nose or ears are specially liable to be infective, and since it is the practice at all hospitals to detain these patients for long periods (in most hospitals no such patient is sent out until either the discharge has ceased, or the patient has passed 12 weeks or more in hospital), it follows that the groups of longer detained patients, especially the groups of over 12 weeks' detention, contain an undue proportion of cases which might be expected to prove infectious; and the fact that these groups show a lower infectivity rate than the average is convincing proof of the gradual disappearance of infectivity on prolonged detention.

While other observers have drawn attention to this point, Dr. Cameron deserves great credit for having established this conclusion on the evidence of so large a number of cases.

B—DIFFERENT CONDITIONS OBTAINING AT THE VARIOUS HOSPITALS.[4]

This subject is a highly complex one, and we fail to find any certain conclusions which can be drawn from the lengthy discussion it receives at Dr. Cameron's hands.

It is unfortunate that Dr. Cameron has commenced his chapter, on the relation between return cases and period of detention, with a comparison between the infectivity rates at different hospitals and the *average* period of detention in each. In any one hospital, though the average detention may be nine weeks, the actual detention of individuals may range from 4 or 5, to 15 or perhaps 20 weeks; also the conclusions shown in table 7, from a record of 15,000 cases, must necessarily be more trustworthy than any drawn from the study of individual hospitals, whose total discharges number 4,000, 2,000 or even less.

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[1] Report p. 5, especially tables 7 and 8.

[2] Table 7, p. 5.

[3] This group is a small one, containing only 193 patients. Probably the majority of these were admitted in a late stage of the disease, so that it is not fair to class them with the rest of the patients who are nearly all admitted within the first week of illness.

[4] Report chap. 3, pp. 3 and 4, with several charts; also pp. 6 and 7, chap. 4 and 5. Appendix, tables 13, 14 (pp. 156-157).

It is a legitimate subject for enquiry, however, whether the observed differences in the infectivity rate among the patients discharged from different hospitals are due to any differences in the routine observed. To establish any such conclusions, it is necessary (1) to find out what points of routine are peculiar to any hospital or group of hospitals; (2) to compare the infectivity rate at this hospital or hospitals with that of the rest, making due allowance for disturbing factors, if this is possible. On the first point Dr. Cameron offers no evidence. Probably he regarded this subject as beyond his instructions. To the second point he devotes much space in his report, especially to the question whether all hospitals transferred the same proportion of "mucous cases." In the end he comes to no conclusion.[1]

The following table[2] gives the number of "infecting cases" discharged from each hospital, with the percentage of the total discharges which were infecting cases.

TABLE B.

HOSPITAL.	E.H.	S.E. H.	N.E. H.	W H.	S.W. H.	N.W. H.	P.H.	B.H.	G.H.	F.H.	G.F. H.[3]	N.H.	TOTAL.
No. of discharges ...	110	481	1478	923	875	921	2215	1647	47	2121	523	4160	15501
No. of infecting cases. A., B. & C.	10	23	48	33	37	46	120	88	8	80	12	148	653
Infectivity rate ...	9·1	4·8	3·2	3·6	4·2	5·0	5·4	5·3	17·0	3·8	2·3	3·6	4·21
No. of infecting cases. A. & C. only	10	16	34	27	29	37	98	69	4	67	9	108	508
Infectivity rate ...	9·1	3·3	2·3	2·9	3·3	4·0	4·4	4·2	8·5	3·2	1·7	2·6	3·28

Assuming that the figures from which group B has been excluded are the more reliable, we find that the rate, as shown in the last line, varies considerably, from 1·7 to 9·1. If, however, the Grove and Eastern Hospitals be excluded on account of the small number of cases discharged from each, the figures all lie between 1·7 and 4·4.

Do the differences between the infectivity rate depend on differences of treatment, or can they be accounted for by other causes? Are the causes such as the Board may hope to control, or do they lie outside the Board's powers? Or are they due to the transferring from one institution to another? To answer these questions Dr. Cameron has devoted many pages of his report, and although a definite conclusion is not yet reached, his figures serve to form a basis for a provisional judgment.

The differences might be due to any of the following causes, or to a combination of some all:—

(*a*) To chance.

(*b*) To differences in the type of case admitted.

(*c*) To differences existing in the homes to which the patients were discharged.

(*d*) To transfer of patients from one hospital to another.

(*e*) To differences in the period of detention.

(*f*) To superior healthiness of one hospital over another.

(*g*) To the separation of acute from convalescent patients at certain hospitals.

(*h*) To differences in the routine of discharging at certain hospitals.

(*i*) To occasional carelessness in carrying out such routine.

(*j*) To the adoption of different standards of fitness for discharge by the various medical officers.

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[1] But possibly he means a negative conclusion. His wording is not clear: p. 11, lines 26-29; also p. 58, conclusion (6).

[2] See appendix tables 13 and 14 (pp. 156-157).

[3] At this hospital cases were only discharged during August, September and October, 1901, and at this season of the year infecting cases were less common than in the year taken as a whole.

The causes (*a*), (*b*) and (*c*) are outside the Board's control; (*d*) chiefly influences the infectivity rate at individual institutions, while (*e*), (*g*), (*h*), (*i*) and (*j*) are more or less in the power of the Board or its officers to alter.

It is hardly possible, at present, to investigate (*h*) or (*j*) statistically, but the figures given by Dr. Cameron deserve examination in relation to each of the other possible causes.

(*a*) *Chance.*—That chance alone is inadequate to explain the differences is shown by the following table of infectivity rates, with their probable errors (B cases excluded):—

Table C.

Eastern	9·1 ± 1·8	North-Western	4·0 ± ·44
South-Eastern	3·3 ± ·55	Park	4·4 ± ·30
North-Eastern	2·3 ± ·26	Brook	4·2 ± ·33
Western	2·9 ± ·38	Grove	8·5 ± 2·77
South-Western	3·3 ± ·41	Fountain...	3·2 ± ·25
Gore Farm[1]	1·7 ± ·38	Northern[1]	2·6 ± ·17
All Hospitals	3·28 ± ·097		

(*b*) *Differences in the type of case admitted.*—The high rates at the Eastern and Grove Hospitals are possibly due to these hospitals having received only selected cases, and those of a severe type. At the other acute hospitals the cases were not selected, except in so far as different hospitals drew patients from different districts. Dr. Cameron remarks on p. 7, "there being no reason to believe that the types of disease admitted to the acute hospitals can differ very much, if at all." But the cases differ considerably in social standing and also in severity of disease, as shown by the death rate. If his argument turns upon the words "very much," we may legitimately compare the variations in the infectivity rate with those in the death rates, as in the following table.

COMPARISON BETWEEN THE DEATH RATES AND INFECTIVITY RATES OF THE ACUTE HOSPITALS.

Table D.

	E.H.	N.E.H.	N.W.H.	W.H.	S.W.H.	F.H.	G.H	S.E.H.	P.H.	B.H.	All Hospitals
Infectivity rate, Aug., 1901—July, 1902	9·1[2]	2·3	4·0	2·9	3·3	3·2	8·5[2]	3·3	4·4	4·2	3·28
Death rate, Jan.—Dec., 1901[3] ...	5·7[2]	3·4	3·9	3·4	4·4	2·7	9·9[2]	5·3	4·7	2·5	3·81
Death rate, Jan.—Dec., 1902[3] ...	3·7	2·5	4·1	4·1	4·0	2·7	5·0	4·3	3·8	2·6	3·45

We therefore believe the influence of the different class of case more important than Dr. Cameron has allowed.

(*c*) *Differences existing in the homes to which the patients were discharged.*[4]—As the poorer classes of the community are more prolific than the well-to-do, there will be, as a rule, more susceptible children in the houses of the former than in those of the latter. There is, therefore, some reason for supposing that return cases, and also infecting cases, would be commoner in some districts than in others, even if the cases of group B (those known to have been infected otherwise than from discharged patients) have been excluded.

Dr. Cameron shows[5] that one borough (A), with over 1,500 cases, had an infectivity rate of 6·58 p.c., at the other extreme (neglecting two boroughs with a less number of cases) borough (V) had almost a thousand cases with a rate of only 2·31 p.c.

The following table, which is copied from table 57[6] of the report, with certain figures recalculated, shews the infectivity rate for each hospital out of a total number of 14,375 discharges.

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[1] These two are convalescent hospitals, the others are for acute cases or acute mixed with convalescent cases.

[2] These percentages are founded upon less than 250 cases each.

[3] From the annual reports of Metropolitan Asylum Board.

[4] Report tables 55, 56, 57 (pp. 33–36).

[5] Table 55 (p. 33).

[6] p. 36.

TABLE E. (Table 57 from Dr. Cameron's report recalculated.[1]) ("A," "B" and "C" cases).

Borough.	S.E.H.			S.W.H.			F.H.			P.H.			B.H.			N.E.H.			W.H.			N.W.H.			N.H.			G.F.H.			Totals.		
	Discharges.	Infecting cases.	Ratio per cent.	Discharges.	Infecting cases.	Ratio per cent.	Discharges.	Infecting cases.	Ratio per cent.	Discharges.	Infecting cases.	Ratio per cent.	Discharges.	Infecting cases.	Ratio per cent.	Discharges.	Infecting cases.	Ratio per cent.	Discharges.	Infecting cases.	Ratio per cent.	Discharges.	Infecting cases.	Ratio per cent.	Discharges.	Infecting cases.	Ratio per cent.	Discharges.	Infecting cases.	Ratio per cent.	Discharges.	Infecting cases.	Ratio per cent.
A										450	33	7·34	964	61	6·32													64	2	3·13	1478	96	6·50
B	103	8	7·76	70	6	8·58	126	9	7·14	738	43	5·82	73	4	5·48										74	2	2·71	69	2	2·90	1253	74	5·90
C																			117	3	2·56	67	7	10·45	155	7	4·52				339	17	5·01
D																397	18	4·54				118	11	9·33	549	24	4·37				1064	53	4·97
E				172	8	4·65	795	39	4·91																176	8	4·54				1143	55	4·82
F							53	1	1·88										49	2	4·08										102	3	2·94
G							56	0	0										83	4	4·82				67	5	7·46				206	9	4·36
H																			175	9	5·14				136	6	4·41				311	15	4·82
I							96	2	2·08										199	8	4·01				134	7	5·22				429	17	3·96
J																363	12	3·30							362	13	3·59				725	25	3·44
K													304	12	3·95										61	3	4·92				365	15	4·11
L	74	5	6·76	270	9	3·33	319	15	4·70	256	13	5·08													186	3	1·61	74	2	2·70	1179	47	3·98
M																200	5	2·50							181	9	4·96				381	14	3·67
N																67	4	5·97	52	4	7·69	316	13	4·12	532	13	2·45				967	34	3·52
O										384	16	4·16	179	7	3·91										45	0	0	68	1	1·47	676	24	3·55
P							121	4	3·30										113	2	1·77				122	6	4·95				356	12	3·37
Q																						101	5	4·95	127	4	3·15				228	9	3·95
R																						53	2	3·77	76	2	2 63				129	4	3·10
S	50	1	2·00							87	2	2·30				187	4	2·14							220	6	2·72				544	13	2·39
T																129	0	0							189	8	4·23				318	8	2·51
U				178	4	2·22	556	16	2·88																111	4	3·60				845	24	2·84
V	144	3	2·08							400	11	2·75				117	3	2·56							179	4	2·23	64	1	1·56	904	22	2·44
W																						115	2	1·74	318	8	2·51				433	10	2·31
Total	371	17	4·58	690	27	3·92	2122	86[2]	4·05	2315	118	5·10	1520	84	5·52	1460	46	3·15	788	32	4·05	770	40	5·20	4000	142	3·55	339	8	2·36	14375	600	4·17

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[1] (p. 36.) Dr. Cameron's totals differ from those in the last column of the above table, his grand total including nearly 1,500 cases of which no details are given (those from Grove and Eastern Hospitals among others.) In order that the argument, which we base upon Dr. Cameron's figures should be correct, we are compelled to work with the correct arithmetical totals in the rows and in the columns. Five small errata in the figures have been detected by Dr. Cameron in the copy of the table, which was supplied to us, and corrected before publication. They are too small to affect our conclusion.

Are we to explain these figures by supposing that home influences, such as the comparative wealth or poverty of the inhabitants or their social habits, cause primarily different infectivity rates in each borough, and that these secondarily produce different rates at the hospitals, through each hospital drawing from a certain district; or vice versa, that differences between the hospitals affect primarily their rate, from which a secondary effect is produced on the figures for each borough? We can test the first hypothesis thus:—

Taking the Park Hospital as an example, 450 patients were discharged to the borough (A). Now the rate for that borough on all its cases was 6·50 per cent. (see last column of the table), and this would correspond to 29·2 infecting cases, presuming this rate to have held good on the 450 patients. The actual number of infecting cases, however, was 33. To borough (B) 738 patients were discharged, and its infectivity rate was 5·90, which would correspond to 43·5 infecting cases, against 43 the actual number. Proceeding thus with each batch of patients discharged from the Park Hospital, we find that 108·5 infecting cases would be expected to have occurred on the hypothesis that the same infectivity rates held good at the Park Hospital for patients discharged to boroughs (A), (B), (L), &c., as among the whole number of cases belonging to the same respective boroughs. The actual number that occurred was 118; so that the difference was not very large.

When all the figures are calculated in this way, we find that on the above hypothesis the number of infecting cases that occurred at each hospital would have been that given in the top row of the next table. The third row gives the calculated probable error, the fourth the differences between the actual and the calculated numbers:—

TABLE F.

	S.E.H.	S.W.H.	F.H.	P.H.	B.H.	N.E.H.	W.H.	N.W.H.	N.H.	G.F.H.	Total.
Expected number of infecting cases ...	13·7	28·2	86·1	108·5	85·8	52·5	32·8	28·6	148·5	15·2	599·9
Actual number	17	27	86	118	84	46	32	40	142	8	600
Probable error	±2·7	±3·4	±6·1	±7·1	±5·9	±4·5	±3·7	±4·1	±7·9	±1·9	—
Difference ...	+3·3	-1·2	- ·1	+9·5	-1·8	-6·5	- ·8	+11·4	-6·5	-7·2	—

It will be seen that in five cases the differences lie within the limits of probable error, in five outside; of the latter, in three cases the difference is less than double the probable error. With the exception, therefore, of two institutions, it is possible to account for the observed differences by the different infectivity rates of the boroughs to which the patients are discharged.

So far we have been trying to find out whether it would be possible by merely mixing patients from different boroughs in certain proportions, each borough keeping its own infectivity rate, to account for the observed differences between the various hospitals; and we have obtained an affirmative answer in every instance but two. It is interesting to examine the opposite hypothesis. Would it be possible by mixing patients from different hospitals in certain proportions to get the observed differences between the boroughs? Before dealing with the figures as a whole, we notice that boroughs A and B each have higher rates than those of any individual hospital. It is therefore impossible to explain their rates as entirely due to the hospitals in which their cases were treated.

When all the figures are calculated on the hypothesis that the hospitals alone are responsible, we get the following table.

TABLE G.

Borough	Expected number of infecting cases.	Actual number.	Probable error.	Difference.
A	77·6	96	±6·4	+18·4
B	58·3	74	5·6	+15·7
C	13·7	17	2·7	+ 3·3
D	38·1	53	4·8	+14·9
E	45·2	55	4·9	+ 9·8
F	4·1	3	1·1	— 1·1
G	8·1	9	2·0	+ 0·9
H	11·9	15	2·6	+ 3·1
I	16·8	17	2·7	+ 0·2
J	24·3	25	3·3	+ 0·7
K	19·0	15	2·6	— 4·0
L	51·4	47	4·5	— 4·4
M	12·7	14	2·5	+ 1·3
N	39·5	34	3·9	— 5·5
O	32·8	24	3·2	— 8·8
P	13·8	12	2·3	— 1·2
Q	9·8	9	2·0	— 0·8
R	5·5	4	1·3	— 1·5
S	20·4	13	2·4	— 7·4
T	10·8	8	1·7	— 2·8
U	33·4	24	3·3	— 9·4
V	33·8	22	3·1	—11·8
W	18·8	10	2·1	— 8·8
Total	599·8	600		

By comparing the last two columns we see that in eight instances the differences do not exceed the probable error, in seven more they do not exceed double, in four more treble, in three more four times, and in the remaining instance five times the probable error.

In conclusion, the figures are not compatible with the hypothesis, that either the boroughs or the hospitals are alone responsible; and we know *a priori* that both must have had some influence upon the numbers of infecting cases. But the figures are more nearly compatible with the former hypothesis than the latter, so that we are justified in assuming that a considerable influence on the infectivity rates of the hospitals has been exerted by the districts from which they draw their cases. It is even possible that home conditions are more important than hospital conditions in determining the infectivity rate.

(*d*) *Transfer of patients from one hospital to another.*—Transferring patients from an acute to a convalescent hospital would not affect the infectivity rate of the former, if cases were sent indiscriminately. But in practice each case is selected for transfer, and we require to know whether those patients who suffered, or had previously suffered, from a discharge from the nose (the type of patient most likely to retain infection) were detained or transferred; or, if some only were transferred, whether they were sent or detained in preference to other cases. We have addressed enquiries on this point to each medical superintendent, and from their replies we find that at three hospitals such cases were sent in preference, and at four were wholly or partially detained. At one no selection on this account was exercised, at one no information is available, and at one no transfers to a convalescent hospital took place.

TABLE H.

	Hospital.	Number Transferred.[1]
Hospitals which selected "mucous cases" for transfer in preference	Fountain	361
	Western	472
		Total ... 833
Hospitals which retained such cases wholly or in part	Eastern	82
	Park	75
	Brook	40
	South-Eastern	439
		Total ... 636
No selection exercised	South-Western	317
	North-Western	1317
		Total ... 1664
Uncertain	North-Eastern	1224

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[1] See Chart VI in report (p. 8).

From these figures it would seem probable that a slightly *increased* proportion of mucous cases were transferred; but the conclusion is weakened by the large number concerning which no information is given.

Dr. Cameron has investigated the point by going through all the bed cards. In order to simplify this laborious task he has adopted an arbitrary definition of "mucous case," including only those cases which had a mucous discharge for one month. We have no reason to suppose that discharges persisting only weeks or days are any less important, while they certainly outnumber the former considerably.

His figures give the following table:—

TABLE I.

	Mucous cases[1]	Non-mucous cases.	Total.	Percentage of mucous cases on total.
Discharges direct from the acute hospitals ...	1369	9449	10818	12·6
Discharges from the convalescent hospitals ...	250	4433	4683	5·3
Total	1619	13882	15501	11·6

He therefore concludes that fewer mucous cases in proportion went to the convalescent hospitals. The two methods give contrary results, and neither is free from objection; the former from the cause already stated; the latter from the uncertainty whether the notes have been made on the same plan at all hospitals, as well as from the arbitrary definition of mucous cases adopted by Dr. Cameron. Since the evidence is conflicting, we cannot say what allowance should be made for possible selection of cases when comparing the acute and the convalescent hospitals.

But in comparing one acute hospital with another, there is a method open to us which avoids both the above sources of error. The rates at the acute hospitals will have been affected by the selection of cases for transfer; those which transferred the mucous cases in preference "thereby relieving themselves of the responsibility of discharging these cases."[2] For all except the Gore Farm cases (523 discharges, with 9 infecting) Dr. Cameron gives us the facts necessary for bringing the responsibility home again. It is only necessary to add for each hospital those cases discharged directly to those discharged indirectly (*i.e.*, after transfer to the Northern). By this means we get the following table (Gore Farm cases omitted):—

TABLE J.

	E.H.	S.E.H.	N.E.H.	W.H.	S.W.H.	N.W.H.	P.H.	B.H.	G.H.	F.H.	TOTAL
Discharges direct or indirect	188	801	2881	1426	1092	2333	2215	1647	47	2348	14978
Infecting cases direct or indirect.[3] A & C only	15	21	68	43	35	73	98	69	4	73	499
Infectivity rate	8·0	2·6	2·4	3·0	3·2	3·1	4·4	4·2	8·5	3·1	3·33

It may be argued that this comparison gives an undue advantage to those hospitals which transferred most, since the infectivity rate at the Northern Hospital (2·6 p.c.) was much less than the average. Instead therefore of debiting each hospital with those of its own cases which proved infective after passing through the Northern Hospital, let us first increase this number in the ratio of the infectivity rates for the Northern and the acute hospitals; i.e., 3·61 ÷ 2·6 = 1·4, and we get the following:—

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[1] See report, Table 11 (p. 9).

[2] See report page 7

[3] See appendix table 14 (p. 157) for direct, and 21 (p. 160) for indirect discharges.

TABLE K.

	E.H.	S.E.H.	N.E.H.	W.H.	S.W.H.	N.W.H	P.H.	B.H.	G.H.	F.H.	TOTAL
Infecting cases calculated as above ...	17	23	81	49	37	87	98	69	4	75	540
Infectivity rate ...	9·0	2·9	2·8	3·4	3·4	3·8	4·4	4·2	8·5	3·2	

The figures in the last row give, as nearly as it is possible to calculate, the infectivity rate that would have occurred at each hospital, if no cases had been transferred. If these figures be compared with the actual infectivity rates of each acute hospital, given above on p. 6, it will be seen that the greatest difference is ·6 per cent; and, if the hospitals be arranged in order according to the two sets of figures, it will be found that only two—the Western and the South-Eastern—have shifted their position. We therefore conclude that the transferring of cases affected the infectivity rates at the various acute hospitals to a moderate extent, in no case exceeding ·6 per cent.

(*e*) *Differences in the period of detention.*—The varying periods of detention at different hospitals probably account for a portion of the difference in their infectivity rates. The infectivity rates of the various hospitals fall naturally into four groups, and the following table shows the mean period of detention in each group. (A and C cases only.)[1]

TABLE L.

		Mean period of detention of all discharged patients.
Hospitals whose infectivity rate falls between	4·0 and 4·4	59·3 days
,, ,, ,, ,, ,,	3·1 ,, 3·3	63·9 ,,
,, ,, ,, ,, ,,	2·3 ,, 2·9	68·8 ,,
Hospital whose infectivity rate was	1·7[2]	64·7 ,,

(*f*) *Superior healthiness of one hospital over another.*—Differences in healthiness between the several hospitals may exist, but there is as yet no evidence on the point. But *a priori* we should expect that the country hospitals would show some advantage over those in town, especially on such a point as the elimination of infection during convalescence.

The number of discharges, of infecting cases and the infectivity rate for the acute and convalescent hospitals was:— (A and C cases only.)[3]

TABLE M.

	Acute Hospitals.	Convalescent Hospitals
Number discharged	10,818	4,683
Infecting cases	391	117
Infectivity rate and probable error ...	3·61 ± ·12	2·49 ± ·15

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[1] See report Table 4 (p. 4) and Appendix Table 14 (p. 157).

[2] See footnote 3 to page 200.

[3] See Appendix Table 23 (p. 161).

This table shows that the convalescent hospitals did in fact show a lower infectivity rate. The patients at the convalescent hospitals, however, differed from those at the acute, having been selected in at least two respects. 1st. Some acute hospitals detained an undue proportion of "mucous cases," others transferred an undue proportion, and it is not certain which influence preponderated. 2nd. The convalescent hospitals received an undue proportion of cases whose ages lay between 4 and 15 years, as shown in the following tables, supplied to us by Dr. Cameron:—

AGE DISTRIBUTION OF PATIENTS DISCHARGED.

"All cases"—July 1st, 1901, to July 31st, 1902.

Table N.

Age periods.	0-1	1-2	2-3	3-4	4-5	5-10	15	20	25	25 and over.	Total.
All Hospitals	146	540	1033	1403	1639	6029	2596	1061	557	497	15,501
Per cent.	·94	3·48	6·66	9·05	10·57	38·89	16·74	6·84	3·59	3·20	
Acute Hospitals	143	540	962	1082	1079	3890	1706	668	384	364	10,818
Per cent.	1·32	4·99	8·89	10·0	9·97	35·95	15·87	6·18	3·54	3·36	
Northern Hospital	3	—	63	285	497	1900	790	349	153	120	4,160
Per cent.	·07	—	1·51	6·86	11·94	45·67	18·99	8·38	3·68	2·88	

"All cases"—July 1st, 1901, to July 31st, 1902.

Table O.

Age Periods.	0-5	5-10	10 years and over.	Total.
All Hospitals	4761	6029	4711	15,501
Per cent.	30·71	38·89	30·39	
Acute Hospitals ...	3806	3890	3112	10,818
Per cent.	35·18	35·95	28·85	
Northern Hospital ...	848	1900	1412	4,160
Per cent.	20·38	45·67	33·94	

The latter age period (4-15) coincides fairly closely with the age period (4-10) at which infective cases are most common;[1] so that this selection has tended to raise the rate at the Northern Hospital. The former selection may have tended to raise or to lower it. In default of material to calculate the extent of these two influences, we may legitimately ascribe the better results at the convalescent hospitals, in part at least, to the better conditions there.

(*g*) *Separation of acute from convalescent patients.*—The separation of acute from convalescent patients only took place at two of the acute hospitals, the North-Eastern and the Park. The following table shows the infectivity rate at these two hospitals, compared with the remainder:—(A and C cases only.)

Table P.

	Hospitals in which acute and convalescent patients were in separate wards.[2]	Other acute hospitals.[2]	Total
Number of discharged patients ...	3693	7125	10,818
Number of infecting cases	132	259	391
Infectivity rate and probable error ...	3·58 ± ·21	3·64 ± ·15	3·61

There was therefore no significant difference between the results of these two groups of hospitals. It would be premature to form a definite conclusion with regard to the principle of separation, for, although the total number of cases dealt with in this table is large, the number of hospitals is small.

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[1] See Appendix Table 34A (p. 170).

[2] Particulars of each hospital are given on p. 200.

(*h*) *Carelessness in carrying out routine in discharging.*—Dr. Cameron deals with this subject by assuming, we think quite fairly, that carelessness would be more evident at times of pressure ; and that, therefore, the monthly infectivity rate should rise and fall with the number of cases discharged.

Table of monthly infectivity rates compared with the total number discharged. (13 months) (A, B and C cases.)[1] To give clearness, the months are not arranged in consecutive order, but in the order of magnitude of the number of cases discharged.

TABLE Q.

Number Discharged during the month.	Corresponding monthly Infectivity Rates.	Mean Rate.	
Between 900 and 1,000	June, 3·3 ; April 4·6 ...	3·9	3·9
" 1,000 " 1,100	May, 3·4	3·4	
" 1,100 " 1,200	February, 5·1	5·1	
" 1,200 " 1,300	July 1901, 2·9 ; August, 3·0 ; March, 4·7	3·5	
" 1,300 " 1,400	July 1902, 3·6 ; December, 6·2	4·9	4·3
" 1,400 " 1,500	—	—	
" 1,500 " 1,600	September, 2·6 ; October, 3·5 ; November, 5·3	3·8	
" 1,600 " 1,700	January, 4·5	4·5	

There is no appreciable difference between months in which large or small numbers were discharged ; so that the figures, as far as they go, confirm Dr. Cameron's statement "that this increase cannot be due to any laxity of vigilance in connection with the discharge of patients."

To summarize this section, the differences between the hospitals are due to so many causes, some of them conflicting, that we cannot say with certainty what has been the effect of those causes which are of practical importance through being under our control. There is, however, presumptive evidence that the transfer of patients to convalescent hospitals has aided them to eliminate their infection. But there is no evidence, as yet, that the separation of acute from convalescent patients in the town hospitals has done so.

The differences between the acute hospitals are not large, and may be due in part to individual differences in medical administration, not capable of exact record. There is, however, no evidence that they are not due to causes wholly outside the hospitals. On the contrary, what evidence exists, tends to shew that both the differences in type of patients received at each hospital, and of home conditions in different parishes, exert an appreciable influence upon the infectivity rates.

C. SEASON OF THE YEAR.[2]

Dr. Cameron's figures show that fewest infecting cases (31) occurred in June and the largest number (85) in November, also that in each of the six consecutive months, from October to April inclusive, the number of infecting cases was above the average (53), and in all other months was below the average. There is, therefore, a very marked rise in the autumn, and fall in the spring and early summer. The numbers are shown on chart I.

Scarlet fever is much more prevalent in the autumn than in the spring, but the inequality noticed above can only in part be accounted for by this fact, since a high prevalence during the autumn and early winter months occurs not only in the absolute number of infecting cases, but also in the proportion that the infecting cases bear to the total number of scarlet fever cases notified.

The infectivity rate, or proportion which the infecting cases bear to the whole number discharged, also shows a marked rise from November to April, with a maximum in December.

This proportion is shown as a percentage on chart II.

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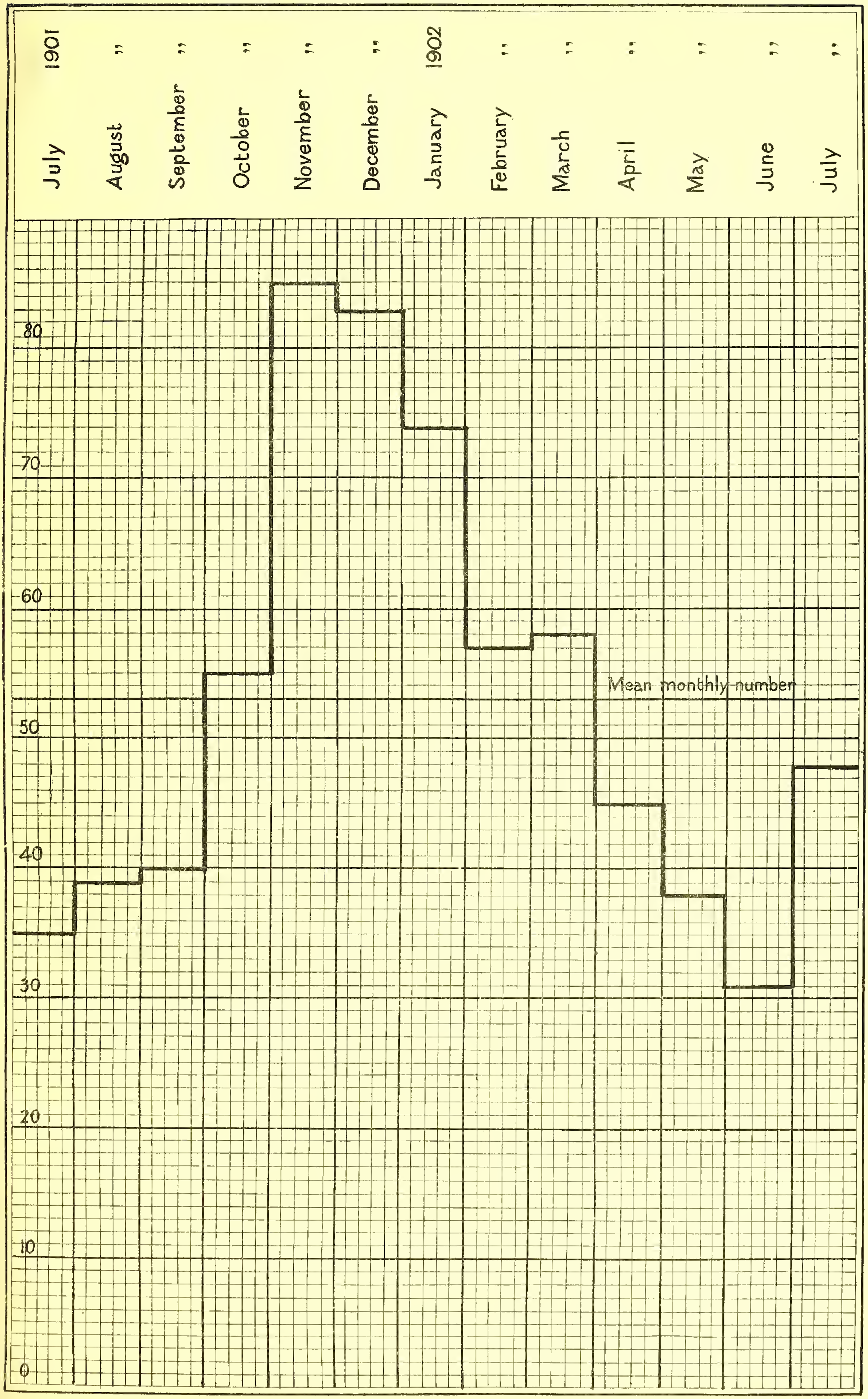
[1] See report Table 33 (p. 21.)

[2] Report Chap. 8 (p. 21) and Appendix Tables 1, 2 and 3 (pp. 148, 149).

To face page 208.

CHART I.

NUMBER OF INFECTING CASES DISCHARGED EACH MONTH.



1

In the preceding paragraphs, the infecting cases have been considered acccording to the date on which they were discharged. Since the average stay in hospital of infecting cases was nine weeks,[1] the date of admission of the infecting cases must on an average have been two months earlier. We should accordingly expect, that in the month of September, more infecting cases would have been admitted than in any other month; and this is shown to have been the case by Dr. Cameron.[2]

Accordingly a greater number of infecting cases were treated in hospital during the months September, October and November, than at any other period.

To what cause, or causes, was this autumnal rise due? In part to the increase of fever at this time; but the effect of this cause can be fully allowed for by taking, not the absolute number, but the infectivity rate as the subject of discussion. We therefore want to account for the high infectivity rate from November to April.

The following table, which is a compilation of Dr. Cameron's results, shows for each month whether the number of admissions, of discharges, or of patients under treatment, were above or below the average of the whole period; and the same information as to average period of detention of all cases and of infecting cases, the prevalence of mucous discharges among patients discharged and the infectivity rate among the same.

TABLE showing the months in which the infectivity rate was above (+) or below (—) the average, also the same information with respect to number of admissions, of discharges, etc.

TABLE R.
Compiled from various tables in Dr. Cameron's report

	Admissions.[3]	Discharges.[4]	Number under Treatment.[4]	Average Period of Detention of all Cases Discharged.[5]	Average Period of Detention of Infecting Cases Discharged.[5]	Prevalence of Mucous Discharges among Patients Discharged.[6]	Infectivity Rate among Patients Discharged.[4]
July, 1901 ...	+	—	+	No figures given	No figures given	No figures given	—
August, ,, ...	—	—	+	+	+	—	—
September, ,, ...	+	+	+	+	+	+	—
October, ,, ...	+	+	+	—	—	—	—
November, ,, ...	+	+	+	—	—	—	+
December, ,, ...	—	+	+	—	—	—	+
January, 1902 ...	—	+	+	+	—	—	+
February, ,, ...	—	—	—	+	+	+	+
March, ,, ...	—	—	—	+	+	—	+
April, ,, ...	—	—	—	+	+	+	+
May, ,, ...	—	—	—	—	+	+	—
June, ,, ...	No figures given	—	—	—	—	+	—
July, ,, ...	No figures given	+	—	—	—	+	—

This table shows that there is no close connection between the seasonal variation of the infectivity rate and that of any of the above causes. Dr. Cameron's opinion is that the variation is due to the weather, which acts by increasing the number of patients who develop nose or ear discharge after they get home, and he brings forward evidence concerning 187 cases in support of this.[7] This conclusion is probably correct, but the statistical evidence is in itself hardly conclusive.

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[1] Report Table 34 (p. 22).
[2] Appendix Table 2 (p. 148).
[3] Appendix table 2 (p. 148).
[4] Appendix table 1 (p. 148).
[5] Report table 33 (p. 21).
[6] Report table 36 (p. 23).
[7] See report table 39 (p. 24).

(4) MISCELLANEOUS.

Dr. Cameron's report contains several chapters which do not bear directly on any of the three main questions enunciated above as requiring investigation, viz. :—

(*a*) The interval.[1]
(*b*) The age and sex of infecting cases.[2]
(*c*) The age of return cases.[3]
(*d*) The mortality of return cases.[4]
(*e*) The average detention in hospital from 1899-1902.[5]
(*f*) Superadded diseases.[6]
(*g*) Secondary cases.[7]

On (*a*) and (*f*) we have nothing to add to Dr. Cameron's statements; and (*e*) has no apparent connection with the subject of return cases. The other points, however, deserve some consideration from us.

(*b*) AGE OF INFECTING CASES.

Dr. Cameron states[8] that "at 5–10 years patients are more prone to cause 'return cases' than at any other age," and in support of his statement refers to table 40. In conclusion (13) p. 57, he states, in other words, that they are much more prone. We are, however, of the opinion that the comparison made by Dr. Cameron of the figures given in that table are not sufficiently accurate to justify his conclusion.

In order to determine which of the three age-periods shown in the table is the most prolific in infecting cases, we require to know—

(i) The total number of discharges during a given period, divided into the three age-periods; and

(ii) The total number of infecting cases occurring amongst these discharges, also divided into the three age-periods.

Dr. Cameron has given (ii) in his report; and he has furnished us with (i)—see p. 207.

These figures are as follows :—

Table S.

Age-period.	0—5.	5—10.	10 and over.	Total.
All cases.				
No. of cases	4761	6029	4711	15,501
Percentage of cases	30·71	38·89	30·39	
Infecting cases.				
No. of cases	212	307	129	648
Percentage of cases	32·71	47·37	19·90	

It will be observed that the percentage given is the proportion the number of cases at a given age-period is of the whole number of cases.

A more accurate comparison is obtained by calculating the proportion the number of infecting cases in one age-period is of the total number of all cases in the same period; as in the following table—

Table T.

Age ..	0—5.	5—10.	Over 10.	Total.
Discharges[9]	4761	6029	4711	15,501
Infecting Cases[10]	212	307	129	648
Infectivity rate	4·46	5·10	2·74	4·18

Showing that the difference between the first two age-periods is not great.

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[1] See Report, Chap. II. (p. 3).
[2] Chap. IX. (p. 24).
[3] Chap. X. (p. 26).
[4] Chap. XI. (p. 27).
[5] Chap. VII. (p. 13).
[6] Chap. XII. (p. 29).
[7] Chap. XIV. (p 37).
[8] P. 25.
[9] See Tables N and O (p. 207).
[10] See Appendix Table 34 (A) (p. 170).

Dr. Cameron's figures also enable us to calculate the infectivity rate for the separate years from 0 to 5.

Table U.

Age ..	0—1.	1—2.	2—3.	3—4.	4—5.	Total.
Discharges[1]	146	540	1033	1403	1639	4761
Infecting cases[2]	4	22	26	60	100	212
Infectivity rate	2·74	4·08	2·51	4·26	6·10	4·46

Shewing that the rate is higher from 3-4, and also from 4—5, than the average rate for all ages. In fact the latter age has a higher rate than any other period for which the figures are given.

(*c*) THE AGE OF RETURN CASES.[3]

Dr. Cameron shows that the average age of return cases is lower than that of other scarlet fever patients, and advances an ingenious explanation of this fact. The primary source of infection in any household must come from outside, and the fact that more children attacked primarily lie between the ages of 5 and 10 than between 0 and 5, does not depend entirely on an age-susceptibility, but largely also on the increased opportunities such children possess for contracting infection out of doors. When, however, an infecting case is discharged home the infants and younger children of the house stand an equal, if not greater risk, than their elder brothers and sisters. Also the primary infection, having mainly affected the elder children, has necessarily left behind an undue proportion of the younger to run the risk of becoming return cases.

(*d*) THE MORTALITY OF RETURN CASES.

The mortality of return cases is not so easy to explain. Out of Dr. Cameron's 930 cases, 54 were fatal, a mortality of 5·8 per cent.[4] The mortality on the whole number of cases completed during the same period is not given. Instead, Dr. Cameron compares the mortality of a different period, viz., January, 1901—December, 1902, obtained from the annual reports, when the scarlet fever mortality was 3·6.

In part the higher mortality among return cases is due to their younger average age, as shewn in the following table:—

Table V.

	Age.	0—5.	5—10.	Over 10.	Total.
Return Cases (13 months)	Cases	355	338	237	930
	Deaths	38	11	5	54
	Death-Rate with probable error	10·70±1·11	3·25±·65	2·10±·63	5·81
All Cases (24 months)	Cases	9,307	11,119	8,616	29,042
	Deaths	710	234	110	1,054
	Death-Rate with probable error	7·63±·19	2·10±·09	1·28±·08	3·63
Difference of death rates with probable error of difference[5]		3·07±1·12	1·15±·66	·82±·64	

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[1] See Tables N and O (p. 207).

[2] See Appendix Table 34 (A) (p. 170).

[3] Report, Table 45 (p. 26).

[4] Appendix Table 53 (p. 182).

[5] Dr. Cameron's method of dividing one death rate by another is very misleading. This is strikingly shown in the last column—over 10 years - where 5 deaths occurred among 237 cases. This Dr. Cameron makes to correspond with an increase of 75 per cent.; although the difference is very probably the result of chance. (See report, p. 27.)

The explanation of this greater death rate is uncertain. We do not consider, however, that the fact can be held to prove any evil influence of detention in hospital wards, unless investigation of the same point reveals its absence in " home return cases."

(*g*) SECONDARY CASES.

Table 45 of Dr. Cameron's report shows that out of 620 houses which he investigated, the primary source of infection caused 737 attacks, whereas in the same houses the return home of the infecting cases caused 852 attacks.

Lest anyone should hold this to show an increased infective power among these cases, we point out that in the primary cases the source of infection lay outside the house and hence exposure was necessarily short. The primary case, being in most instances promptly removed, had little opportunity of infecting; whereas the infecting case remained in the house generally several days, sometimes several weeks, and hence had fuller opportunities of spreading infection.

For instance, if a child contracts scarlet fever in school or while playing in the streets, he himself only is exposed, his brothers and sisters in most instances run no risk from the original source. When the first child developes the disease, they incur risk of infection from him; but since most cases are removed within three days from the onset of fever, their risk lasts generally only for a short time. But, if a discharged patient remains infectious, his brothers and sisters may run a risk for several weeks. Often, indeed, the exposure continues after one of them has developed the disease (*i.e.*, after the first return case has been removed.)

(5) Conclusions.

There are two theories to account for the persistence of infection in some cases of scarlet fever. Either the infection belongs to the patient himself, or he picks it up from his surroundings. The latter view was brought forward in Prof. Simpson's report, but without any direct evidence to support it. In view of the fact that infection is less common in cases discharged after 12 weeks' detention, than in cases discharged earlier, we think the theory can no longer be held. The former theory, which also is unsupported by direct evidence, must be considered the only possible one at present. The chief argument against it is the supposed greater incidence among hospital than among home treated cases. Such statistics as are at present available undoubtedly show return cases to be rarer among home treated patients. But we would point out that statistics of home treated cases are very imperfect. Less than 20 years ago the belief was common among medical officers of fever hospitals, that such return cases, as were reported, were merely alleged cases of infection, which proper investigation would clear up. Such a view has found expression in official reports by the officers of this Board. The argument, that because all known precautions had been taken, infection from the discharged patient was improbable, having been held not so long ago by officers of fever hospitals, possibly survives to a great extent among the bulk of the medical profession. Hence it is probable that many return cases occur but remain unrecorded, since the observers attribute the result to a different cause.

Also there is one factor which tends to prevent return cases among home treated patients. The latter belong chiefly to a better social class than those treated in hospital. And between the upper and lower classes are two important differences. The former have on an average fewer children in a family,[1] and it is not so common among them for two children to share the same bed.

Dr. Chapin, of Providence, reports the results of a system of isolation almost the opposite of that adopted in England. In that town, during a period of 17 years, certain cases of scarlet fever were treated at home, the remaining children of the family being sent away until the patient had recovered. During the whole period 652 families were attacked and 1,051 persons, mostly children, none of whom had had the disease, were sent away. On the return home of the healthy children 19 were attacked with fever (2·9 per cent. calculated on the number of families). This number nearly represents the infectivity rate of the total number of cases isolated at home.

We give here in full the conclusions come to by Dr. Cameron, with our comments thereon. With many we agree; some appear possible or probable, but not proved; and with a few we are not able to agree.

Dr. Cameron's conclusions to Part I of his report[2].	*Comments.*
(1) That during the thirteen months ending July 31st, 1902, there were 688 alleged " infecting cases," which, calculated on the total number of patients discharged, gives 4·1 per cent.	Agreed.

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[1] Dr. Niven says (Annual Report of Medical Officer of Health for Manchester, 1901, p. 58): " We thus see " that not only are the patients in hospital on the average removed from homes poorer than those in which the patient " is kept at home, and, therefore, more crowded, but, that, in addition, the numbers present in the former homes are " considerably greater, while the proportion of susceptible persons under 15 years of age is about double."

[2] p. 57. These conclusions are copied from the report as it was submitted to us. Several slight alterations have been made in the published report, which is bound up with these observations.

Dr. Cameron's conclusions to Part I of his report.	*Comments.*
(2) That of the alleged "infecting cases" 46·5 per cent. appeared to be the cause of the "return cases." In 36·9 per cent. the evidence was not sufficiently conclusive to enable me to arrive at any definite decision. In the remaining 22·5 per cent., the "return cases" were apparently affected from some other source.	Agreed, 40·5 instead of 46·5.
(3) That after the discharge of the alleged "infecting cases," in 46·8 per cent., the first "return case" was taken ill within an "interval" of one week; in the second week 26·5 per cent.; in the third week 11 per cent; after an "interval" of eight weeks "return cases" practically ceased.	Agreed.
(4) That the period of detention of the "infecting cases" was practically the same as for "all cases."	Agreed.
(5) That of the patients discharged under 8 weeks and over 8 weeks, the proportion of "infecting cases" is the same, but of the latter cases, those detained the longest give the best results.	Agreed.
(6) That the number of "infecting cases" at the Acute Hospitals are not appreciably influenced, if influenced at all, by the transfer of patients to the Convalescent Hospitals.	Dr. Cameron's own statement earlier in the report was that the evidence was insufficient to form any conclusions. We, however, find that differences of about ½ per cent. may be due to this transfer.
(7) That the results of the Convalescent Hospitals compare favourably with those of the Acute Hospitals.	Agreed.
(8) That "return cases" occur at all months of the year, but more especially from November to April.	Agreed.
(9) That the increase during these months does not correspond to a reduction in the period of detention.	This statement is hardly correct unless qualified. We have shewn on pages 208 and 209 that the greatest monthly numbers of "infecting cases" occurred in November and December, in both months the detention was 5 days below the average. It is, however, true that taking the thirteen months as a whole, there is no close correspondence between high infectivity rates and short average period of detention.
(10) That this increase is not a mere coincidence dependent on outside sources of infection. This is shown by the fact that the largest number of "return cases" occurred at the time of least epidemic prevalence, and the converse also holds good. Moreover, the increase in the number of "return cases" commences somewhat suddenly and ends with equal abruptness.	The first two of the alleged facts are incorrect. The largest monthly number of "return cases" occurred in December, and the largest number for any three-monthly period occurred from November to January. The time of least monthly prevalence was February, and of least three-monthly prevalence was February to April. The greatest infectivity rate for any three-monthly period was also from November to January.
(11) That it is not due to a laxity of vigilance in connection with the discharge of patients. This is shown by the fact that the largest number of "return cases" did not occur at the time when the daily average number of patients under treatment was greatest, or during the months of maximum discharges—the time when the strain, if any, on the administration would be greatest.	Here also the alleged fact is incorrect. The largest daily average under treatment occurred in November in which also the largest number of infecting cases and the third largest number of return cases occurred. If the facts as to seasonal incidence be considered in the light of the whole period, and not only the maximum incidence, as in our table on p. 209, it will be seen that there is no close correspondence of the infectivity rate with either the number under treatment or the number discharged.

Dr. Cameron's conclusions to Part I of his report.

Comments

(12) That during the months from November to April, when the largest number of "return cases" occurred, the "infecting cases" suffered from mucous discharges after leaving hospital, much more frequently than during the remaining months.

Agreed.

(13) That between the ages of from 5 to 10 years, patients carry home infection much more frequently than at any other age period.

We would re-word this as follows:—"between the ages of 4 and 10 years, patients carry home infection more frequently than at any other age period;" omitting the word "much."

See p. 21

(14) That between the ages of from 5 to 10 years an unduly large proportion of "infecting cases" suffer from morbid affections of the nose.

(14) Is incorrect; the following table gives the figures:—[1]

Table

INFECTING CASES ONLY.

	AGE.			
	0—5	5—10	Over 10	Total
Cases with nasal discharge ...	123	170	45	338
Cases without nasal discharge	89	137	84	310
Total infecting cases... ...	212	307	129	648
Percentage affected with nasal discharge	58·0	55·3	34·8	52·2

Shewing that among these 648 infecting cases nasal discharge is slightly more common in proportion under 5 years of age.

(15) That adults who seldom suffer from nasal affections after discharge, cause "return cases" on comparatively few occasions.

Agreed.

(16) That, compared with "all cases," an unduly large proportion of "return cases" are children under 5 years of age.

Agreed.

(17) That the mortality of "return cases" was 5·8 per cent., as compared with 3·6 per cent. for "all cases," and that this higher mortality affected all ages, increasing with the age of the patient.

The words "increasing with the age of the patient" are misleading.

(18) That the increased virulence of the "infecting case" is not due to prolonged residence in hospital. This is shown by the fact that patients discharged after a detention of ten weeks and over cause a lower mortality than those discharged before this period.

Dr. Cameron has brought no evidence to show the lower mortality.

(19) That 5 per cent. of the total scarlet fever admissions contract an infectious disease other than the one for which they are admitted, and that the average period of detention of such cases was 98·7 days, as compared with 64·5 days for "all cases."

Agreed.

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[1] See appendix tables 34 A, 34 B (p. 170).

Dr. Cameron's conclusions to Part I of his report.	*Comments.*
(20) That, so far as I am able to judge from the extent of my enquiries on this point, it is my belief that home disinfection has not any appreciable effect on the number of "return cases."	Agreed.
(21) That, apart from their condition on discharge, patients who suffer from complications in hospital are more prone than uncomplicated cases to cause "return cases," the effect of these complications being to prolong the period of infectiousness.	This statement is not correct without qualification. The only evidence Dr. Cameron brings forward on this point is Table 20, based on 500 cases only. We have reason to believe that certain complications, such as nasal discharge, may be infectious, but there is no evidence that all complications have this effect.
(22) That the complication most frequently present after discharge is a morbid condition of the nose.	We should insert the words "in infecting cases" after the word "discharge." Otherwise the statement is incorrect.
(23) That patients may continue to be infectious for some time after the objective signs of these complications have disappeared.	Agreed.
(24) That patients suffering from a morbid condition of the nose, may continue to be infectious long after removal from the hospital environment. Consequently, separate isolation of these cases for a period of ten days before leaving hospital, if efficacious at all, can only be so to a limited extent.	We agree to the first sentence; but not to the second, unless qualified. We would strike out all the words after "hospital" and substitute "can only be partially successful." If the duration of this infection in cases isolated in single rooms could be worked out, the information would be very useful to us as a guide to the proper period to detain them.
(25) That, while at the time of discharge, the infection may in some cases be in an active state, in others it is probably quiescent, and remains so for some time after leaving hospital.	Agreed.
(26) That the occurrence of a nasal discharge for the first time after returning home, or the recurrence of the discharge which had ceased some time before the patient left hospital, is apt to be attended by what appears to be a recrudescence of infection, and similarly the occurrence after discharge of other complications such as tonsilitis may be followed by "return cases."	Agreed.
(27) That the secondary complications, which occur in hospital during convalescence, may at times represent abortive relapses of the disease, and be analagous to the recrudescence of infection which takes place out of hospital.	We would alter this to "That certain complications, which occur during convalescence, may represent abortive relapses of the disease." We do not believe that the same is true of all complications of convalescence.
(28) That patients discharged with otorrhœa, except when a morbid condition of the nose co-exists, are but seldom associated with the occurrence of "return cases."	This conclusion still wants evidence.
(29) That the discharge from the nose is not necessarily infectious *per se*, but in a very large proportion of the cases its presence, especially when purulent, is an almost certain indication that the patient is infectious.	This statement is much too strong. As it stands, it would almost serve to attach criminal liability to anyone who discharged such a case. Sometimes, moreover, the nasal discharge persists for many months, and detention until complete cure is obviously impracticable, nor, in our opinion, is it necessary.
(30) That late desquamation cannot be regarded as evidence of infectiousness.	Agreed.

Dr. Cameron's conclusions to Part I of his report.	*Comments.*
(31) That in the majority of cases the "return case" appears to be due to a delay in the process of elimination of infection in the "infecting case," and consequently "return cases" are due to premature discharge, although in point of time the proportion of "infecting cases" to "all cases" discharged under eight weeks is the same.	The statement is correct, but should be qualified by pointing out that the prematureness of the discharge could not have been foreseen.
(32) That the direct cause of the retardation is probably due to infection by sepsigenic organisms to which aggregation predisposes.	This conclusion is hypothetical, but Dr. Cameron has not adduced any evidence in support of it.
(33) That for patients predisposed to, or who have suffered from, mucous discharges in hospital, the omission in the winter months of the warm bath immediately before discharge, and the substitution of one on the previous evening, would tend to lessen the number of "return cases."	We think this ought to be tried.
(34) That it is impossible, under the present conditions of hospital treatment, to avoid the occurrence of "return cases," but with more extended means of isolation than at present obtain, combined with asepsis, a reduction, perhaps a considerable reduction, in their number would result, and the number of complications, as well as "superadded diseases," which together constitute the chief cause of prolonged detention, might be considerably lessened.	In the present state of our knowledge it is difficult to see how the occurrence of return cases can be prevented, either in home-treated or hospital-treated patients; but we consider that the measures recommended by Dr. Cameron should be tried experimentally.

Conclusions found in the body of the report, pp. 20-21.	*Comments.*
(1) That a morbid condition of the nose was the lesion most commonly associated with the illness of "return cases."	Agreed, but insert "in infecting cases" after the word "nose."
(2) That although desquamation was the morbid condition most frequently present at the time of discharge, it was comparatively seldom associated with the illness of "return cases"; which evidence, therefore, fails to support the theory that this late peeling is infectious.	Agreed.
(3) That, except when other morbid conditions co-existed, patients who suffered from otorrhœa did not, as a rule, cause "return cases."	We desire to have furthur evidence on this point. See No. (28) above.
(4) That cases, in which no morbid condition could be detected, might yet prove infectious.	Agreed.
(5) That apart from the condition on discharge, patients who suffered from complications in hospital were more prone than uncomplicated cases to cause "return cases."	We desire further evidence than is found in Dr. Cameron's report (see conclusion, No. (21).
p. 26.	
Nos. (1) and (2) see Nos. (13) and (14) above.	
(3) That although the largest proportion of patients discharged with otorrhœa are under 5 years of age, at ages of from 5-10 years, a relatively larger number of such cases are associated with the illness of "return cases."	The evidence appears to us very weak.

Conclusions found in the body of the report.	*Comments.*
p. 44.	
(1) That persons suffering from sore throat, or other anomalous illnesses, may convey scarlet fever infection to others.	Agreed.
(2) That there may be a latent period after the reception of the infection, and the onset of the illness.	Dr. Cameron evidently refers to an incubation period of unusual duration. Although he has collected several interesting cases pointing to this conclusion, we think that the connection between the cases and the presumed source of infection is not definitely proved.
(3) That after the reception of the infection, and before the appearance of the rash, patients may suffer from an illness lasting considerably longer than the usual period of invasion.	This is probably true, but further evidence is desirable.
(4) That without having previously suffered from this disease, individuals may act as carriers of scarlet fever infection, and continue to be in normal health.	This is not yet proved, in the sense that Dr. Cameron means.
p.p. 49 to 50.	
(I) That the "infecting cases" which retain their infection longest are those which suffer from "secondary" complications (p. 40).	Insert the word "certain" before "secondary."
(II) That "infecting cases" which suffer from complications may continue to be infectious long after leaving the hospital environment. Consequently, the separate isolation for a period of ten days before leaving hospital of all cases suffering from mucous discharge, as has been suggested, is only likely to prove partially if at all efficacious.	See comment on No. (24) above.
(III) That, while at the time of discharge the infection may in some cases be in an active state, in other cases it is probably quiescent and remains so until some time after leaving hospital.	Agreed.
(IV) That the occurrence of a nasal discharge for the first time after returning home, or the recurrence of the discharge, which had ceased some time before the patient left hospital, is apt to be attended by a recrudescence of infection, and similarly but not so frequently the occurrence after discharge of other complications, such as "sore throat," may also be followed by "return cases."	Agreed.
(V) That the "secondary" complications which occur during convalescence, may at times represent abortive relapses of the disease and be analagous to the recrudescence of infection which takes place after leaving hospital.	See comment on No. (27), as above.

We disagree with Dr. Cameron in his views on the infectiousness of certain complications, in favour of which he quotes authorities but cites little evidence. He quotes one case at the head of p. 53, of a striking character, but as all of us have seen dozens, perhaps hundreds of instances, where a septic case was placed near a mild case without evil consequence, we are not convinced that such infection has spread under ordinary hospital conditions.

The opinion that complications are more prevalent in old than in new hospitals is not borne out by the experience of the Metropolitan Asylums Board.

Dr. Cameron gives a brief account of the method of dealing with infectious diseases in certain of the French hospitals,[1] and advocates its use in the Managers' hospitals, with the idea of reducing the period of detention, the number of "return cases," and superadded infections. The essence of this method lies in the rigid aseptic treatment of the patient and his surroundings. In order more thoroughly to ensure this, the patient is placed in a small chamber, or cubicle, by himself. Unless, however, asepsis is carried out in the smallest detail, isolation of patients in separate rooms or cubicles in a common ward is of little or no avail.

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[1] Chapter XVIII. p. 55.

We may point out that this system has been adopted in Paris in order to prevent the spread in the wards of other diseases than those for which the patient was admitted (*e.g.*, measles amongst scarlet fever cases). But, unless we except the broncho-pneumonia that so commonly complicates measles, it does not appear to have been applied with a view to preventing the spread of any of the complications of the acute specific fevers. We have, indeed, no evidence that these complications are communicable. Dr. Cameron assumes that they are, and upon this assumption is based his recommendation of the French method, with a hope of lessening the number of return cases; return cases being, according to him, more dependent upon complicated than uncomplicated cases. If, therefore, Dr. Cameron's recommendation be adopted, and we trust that it will be in some of the hospitals, it will be entirely in the way of an experiment from this point of view.

The question of return cases does not appear to have attracted attention in France. There is a little evidence to show that they do occur (see "Les Médications Préventives," by Dr. J. Nattan-Larrier, p. 18), but to what extent we have not been able to ascertain. It will be seen below that we recommend an experiment on the lines suggested.

(6) Recommendations.

As a result of our examination of the facts brought forward by Dr. Cameron and such other sources of information as are known to us, we recommend—

(1) That, as far as practicable, every patient, as soon as he is in a fit condition, and without regard to age or sex, be transferred from the acute to the convalescent hospitals.

(2) That a discharge ward for scarlet fever be established at each hospital, into which the patient could be admitted and bathed not later than the day before discharge.

(3) As we are of the opinion that harm has resulted from the abrupt transition from hospital to home conditions undergone by patients immediately on discharge, we recommend that every endeavour should be made to prepare patients for this change, especially by providing facilities for their being in the open air. At some of the hospitals this will involve the erection of verandahs or other form of shelter.

(4) That the following notice be printed and a copy sent with the notice of discharge to the parent or guardian of every discharged scarlet fever patient—

> "Although every endeavour is made to send out patients free from infection, it is advisable, as an additional precaution, that they should, as far as possible, be kept away from other children, including attendance at school, for the first three weeks after their return home. They should certainly not sleep in the same bed, and, if possible, not in the same room with children who have not had the disease.
>
> "It is also advisable that articles used by the patients, such as cups, plates, spoons, handkerchiefs, towels, and toys, should, during this period, be kept distinct from those used by other children.
>
> "The above precautions are specially important in the case of those patients suffering from discharge from either nose or ears."

(5) That at one hospital, say the South-Eastern, now in course of re-building, two or more wards be divided by glass partitions into separate rooms, and that scarlet fever patients be treated therein on the system of complete isolation during the whole period of detention, so far as that may be found practicable; and that the effect of this procedure on the occurrence of return cases should be carefully observed.

(6) That similar rooms be erected at two other acute hospitals in which scarlet fever patients may be isolated for at least three weeks after admission. The patients being afterwards drafted into convalescent wards, the complicated and uncomplicated cases being kept separate. The structural arrangements of the rooms mentioned in this and the preceding recommendations to be carefully considered by the medical superintendents.

(7) That inquiry into the subject of return cases should be continued, on lines to be suggested by the medical superintendents.

(8) That arrangements be made to notify each return case to the superintendent of the hospital from which the infecting patient was discharged.

The adoption of certain of the above recommendations would necessitate an increased number of staff, and would also diminish the accommodation available for the direct admission of cases. We consider that both these changes are justified by the prospect of reaching a higher standard of efficiency in the purpose for which the hospitals are primarily intended, viz., the protection of the public from infection.

Part II.

DIPHTHERIA.

Dr. Cameron's report on diphtheria return cases is much shorter than that devoted to scarlet fever, and, in addition, is much more clearly expressed. In many cases he gives the actual numbers on which his statements are based, whereas the corresponding figures in Part I. have to be calculated either from percentages or by addition. It is, therefore, possible for us to deal with this part of his report more concisely. Also many of our previous criticisms apply equally to both parts, and it is, therefore, unnecessary to repeat them here.

Return cases of diphtheria are not so common as those of scarlet fever, either absolutely or in proportion to the total number of cases discharged. Out of 6,866 diphtheria patients discharged, some number between 73 and 87 patients has proved infective (the report does not give nearer information than this). Accordingly, the gross infectivity rate lies between 1·06 and 1·27 per cent., as against 3·94 for scarlet fever.

After investigations at the houses concerned, Dr. Cameron is inclined to attribute a larger proportion of these to other causes than in the case of scarlet fever. Of the 87 cases he classes 29 in group B and only 24, or less than one-third, in group A.

(1) Can any difference be shown to have existed between the infecting and non-infecting discharged patients?

The facts bearing on this question are in striking contrast to those connected with scarlet fever. In the latter disease less than 20 per cent. of the infecting cases shewed no morbid condition when examined at home. The corresponding figure for diphtheria was over 60 per cent.[1]

Out of 71 cases only 26 shewed any morbid condition, and of these 19 had some nasal discharge or other affection of the nose.

As in scarlet fever, a nasal discharge seems to be in many instances evidence of infection.

Only 74 out of the total number discharged had a nasal discharge when they left the hospital. If 19 out of these proved infective, the percentage of infectivity among cases of this type was so high (25 per cent.) that a grave risk would be undertaken whenever such a case was discharged. Possibly, however, some of the 19 cases developed the condition for the first time after return home.

The figures shown lead us to suspect that otorrhœa after diphtheria may be infectious. Only five such patients were discharged, and of these, two proved infective.

(2) Have any of the following causes exerted an influence upon the infectivity occurring among discharged patients.

A.—PERIOD OF DETENTION.

The following table[2] shows the numbers that were discharged at each period, with the number out of each group which subsequently became infecting; also the percentage and probable error:—

Table X.

	Period of detention in weeks.							
	Under 4	4-6	6-8	8-10	10-12	12-14	Over 14	Total.
No. of discharges ...	223	1726	2059	1133	703	468	554	6866
No. of infecting cases ...	2	13	25	12	13	11	11	87
Percentage	·90 ± ·41	·75 ± ·14	1·21 ± ·16	1·05 ± ·20	1·85 ± ·34	2·35 ± ·47	1·98 ± ·40	1·26 ± ·09

From this it will be seen that those patients who were detained for 12 weeks and longer were the most infective. This does not necessarily shew that they contracted the infection on account of their long detention, but is equally compatible with the explanation, that the cause of their long detention was also the cause of infection persisting after their return home; a large number of patients were detained longer than the usual time, on account of slight chronic inflammation of the nose or throat, and out of this number came a proportion of infecting cases greater than the average, in spite of their increased length of stay in hospital.

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[1] Report Part II., table 20 (p. 72).

[2] See Report, part II., table 15 (p. 66).

B.—DIFFERENT CONDITIONS OBTAINING AT THE VARIOUS HOSPITALS.

The following table gives the number of discharges from each hospital, the number of infective cases, and the infectivity rate at each[1]:—

Table Y.

	E.	S.E.	N.E.	W.	S.W.	N.W.	P.	B.	G.	F.	N.	Total.
No. of discharges ...	816	518	640	638	413	777	573	716	1340	0	435	6866
No. of infecting cases	13	1	5	9	5	6	12	9	21	2	4	87[2]
Percentage	1·60 ± ·3	·19 ± ·13	.78 ± ·24	1·41 ± ·32	1·21 ± ·37	·77 ± ·21	2·09 ± ·41	1·26 ± ·28	1·56 ± ·23	—	.92 ± ·31	1·26 ± ·09

It will be noticed that the number of infecting cases reaches 20 at one hospital only, and Dr. Cameron rightly observes that not much importance can be attached to comparisons between such small figures. The differences are not much larger than might occur from chance alone.

It will be noticed, however, that, if arranged in accordance with the magnitude of their rates, the hospitals follow nearly the same order in diphtheria and in scarlet fever; so that the differences may partly be due to other than accidental causes.

In attempting to trace these causes we have a simpler problem than in the corresponding section of Part I. In the first place there was much less transferring, only 6 per cent of the whole number having been sent to the Northern Hospital. It is, therefore, certain that this process could not have much affected the infectivity rates. Secondly, acute and convalescent patients were treated in the same wards at all hospitals.

In comparing acute and convalescent hospitals it will be noticed that no cases were discharged from Gore Farm. The Northern had a lower rate than the average of acute hospitals, but the figures are too small to warrant any conclusion.

In one important point, however, the routine in discharging varied at different hospitals. At some the patients were examined for discharge entirely by eye; in others this was supplemented by a bacteriological examination. At those of the former group such an examination was made in special cases, but such cases can hardly have been numerous enough to affect the infectivity rate.

The following table shows the figures for the two groups:—

Table Z.

	Hospitals using the Bacteriological Test as a routine.	Other Hospitals.	Total.
No. of discharges	3351	3515	6866
No. of infecting cases ...	37	48	85
Infectivity rate	1·10 ± ·12	1·36 ± ·13	—
Difference	·26 ± ·18		—

The difference is in favour of those hospitals which have used the test, but being only $1\frac{1}{2}$ times the probable error, we cannot rely on its being due to this cause and not to chance.

C.—SEASON OF THE YEAR.

The effect of season on the infectivity rate is less marked in the case of diphtheria than in scarlet fever, but the rise occurs at the same time of year; viz., from late autumn to early spring. Probably both rises are due to a common cause.

---

[1] See Report Part II table 19 (p. 70).

[2] Among these 87 cases Dr. Cameron has included some who were not included among the 6,866, as is shewn by the figures for the Fountain Hospital Possibly therefore, others of the percentages are incorrect. (See the last paragraph of Part III. of this report, pp. 223–4.)

The figures for each month are given in the following table[1] :—

Table AA.

	1901. Aug.	Sept.	Oct.	Nov.	Dec.	1902. Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Total.
No. of discharges ...	565	608	717	639	666	639	473	518	529	558	444	510	6866
No. of infecting cases	6	9	4	13	5	8	12	6	9	9	4	2	87
Percentage...	1·06	1·48	·55	2·03	·75	1·25	2·53	1·15	1·70	1·61	·91	·39	1·26

(3) **Miscellaneous.**

A.—THE INTERVAL.

Dr. Cameron's tables show that the interval between the discharge of the infecting case and the onset of illness in the return case exceeds a fortnight in 40 per cent. of the cases, a larger proportion than in scarlet fever.

B.—THE AGE OF INFECTING CASES.[2]

and

C.—THE AGE OF RETURN CASES.[3]

The infecting cases are on the whole more prone to occur at the ages between 2 and 10 years than at other ages. The return cases occurred at nearly the same ages as among the rest of the diphtheria patients.

D.—SUPERADDED DISEASE.[4]

Dr. Cameron shows that out of 22 infecting cases which were discharged after a detention of 12 weeks or over, 10 had suffered from a mixed infection; and concludes from this, that such cases are specially liable to convey infection. We do not consider this conclusion justified on the evidence, for there is nothing to show whether the proportion of cases of mixed infection was larger or smaller among the patients who did not prove infecting.

(4) **Conclusions.**

We give below Dr. Cameron's conclusions to Part II of his report with our comments.

Dr. Cameron's conclusions to Part II of his report.[5]	*Comments.*
(1) That, subsequent to the discharge from the Board's hospitals of 6,866 recovered diphtheria patients and 15,501 scarlet fever patients, there were 142 separate outbreaks of diphtheria, of which 87 of the "infecting cases" suffered from diphtheria, and 55 from scarlet fever.	Agreed.
(2) That the 87 "infecting cases" are equivalent to 1·2 per cent, calculated on the total diphtheria discharges, and the remaining 55 cases to ·35 per cent. on the scarlet fever discharges.	Not strictly correct, see Part III. of our report (p. 223).
(3) That, of the 142 "infecting cases," 30·2 per cent. appeared to be the cause of the "return cases." That in 33 per cent. there was reason to believe that the "return cases" were infected from some other source. That in 36·6 per cent. the evidence was of doubtful nature, and it was impossible to exclude the discharged patients as the cause of the "return cases."	Agreed.
(4) That, within an "interval" of one week after the discharge of the "infecting cases," nearly one-third of the "return cases" were attacked—29·8 to 31·6 per cent. Within an "interval" of a fortnight about 59 per cent.	Agreed.

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[1] See Report, Part II., Table 5 (p. 62).

[2] See Report, Part II., Table 7 (p. 63).

[3] See Report, Part II., Table 10 (p. 64).

[4] Report, Part II., p. 67.

[5] P. 76.

Dr. Cameron's conclusions to Part II of his report.	*Comments.*
Within an "interval" of a month from 96·3 to 88·5 per cent. After an "interval" of six weeks there were two cases, one in the eighth and one in the thirteenth week.	
(5) That "return cases" occurred in all months of the year, but more especially during the months from November to April.	Agreed.
(6) That the increase during these months was not brought about by a reduction in the period of detention.	Agreed.
(7) That the average period of detention of the "infecting cases" was 65·4 days, or nearly eight days longer than "all cases."	Agreed.
(8) That a morbid condition of the nose was present in 26·6 per cent. of the "infecting cases" that suffered from diphtheria, and in 52·7 per cent. of the cases that suffered from scarlet fever.	Agreed.
(9) That between the ages of from 5-10 years the discharged patients are more frequently associated with the illness of "return cases," than at any other age or period, and that after ten years the association is comparatively rare.	It would be more correct to substitute 2-10 for 5-10.
(10) That between the ages of from 5-10 years the incidence of mucous discharge is greatest, while after this age it seldom occurs.	The difference between the first two quinquennia of life is inappreciable.
(11) That the patients discharged after a detention of 8-12 weeks cause a relatively larger number of "return cases" than those discharged under 8 weeks, and those discharged after a detention of 12 weeks and over more than those at any other period.	Agreed.
(12) That the hospitals which had the highest and lowest average period of detention had also the least number of "infecting cases."	The word "acute" must be inserted before "hospitals," otherwise the statement is not correct.
(13) That the bacteriological examination of both throat and nose of all cases of diphtheria prior to discharge, and the separate isolation for a probationary period of all cases of scarlet fever, immediately they are admitted to hospital, with a view to classifying them later, would tend to reduce the number of "return cases" of diphtheria.	Neither of these statements is proved in the report, but there is sufficient evidence from other sources to justify a further trial of the first of these methods.

From the evidence collected by Dr. Cameron, we see that return cases are less common after diphtheria than after scarlet fever; and that a larger proportion of the alleged cases were doubtful or proved coincidences. Further, a larger proportion of the diphtheria return cases must be classed (provisionally at any rate) as non-preventible; since no abnormal condition was detected in the supposed infectious cases.

We are not prepared to recommend at present any special systems of isolation even experimentally.

The question whether a bacteriological examination before discharge gives any additional security should be further investigated.

Part III.

MIXED INFECTION AND CROSS INFECTION.[1]

In several cases a scarlet fever patient was discharged from hospital and an alleged return case of diphtheria was admitted or *vice versa.* Also some cases occurred where either the infecting or the return case suffered from both diseases; and others where a patient discharged after one of these two diseases was alleged to have infected two or more, some with scarlet fever and some with diphtheria.

In the first class of cases, where one patient recently recovered from scarlet fever is alleged to have infected another with diphtheria, there is a strong presumption against the infection having occurred as alleged. Yet, after investigation of 55 such cases Dr. Cameron concludes that in 19 at least, and possibly in 37, the alleged infection was the true cause. The number of such cases in itself lends suspicion to the supposed transference of infection, and so does the fact that such detailed tables of these cases as Dr. Cameron has worked out follow closely the corresponding figures for scarlet fever and diphtheria.

Probably therefore a very small proportion of the discharged scarlet fever patients, about ¼ per cent., are capable of conveying the infection of diphtheria, either because they have suffered from that disease in a mild and unrecognised form, or else because they are acting as carriers of the bacillus of diphtheria without themselves suffering in any way.

We would point out here that Dr. Cameron has confused the figures of these cases with those which relate to other groups of cases, viz., scarlet fever giving rise to scarlet fever, and diphtheria to diphtheria respectively, thus introducing errors in a number of his percentages. Thus on page 2 the first paragraph states that 688 outbreaks of scarlet fever occurred after the discharge of 16,702 cases of scarlet fever from hospital. This is incorrect; for, as Dr. Cameron himself tells us in the next paragraph, 30 of these outbreaks occurred after the discharge of diphtheria cases. That is to say, 30 out of the 688 cases had nothing whatever to do with the group of 16,702 cases which are under consideration. Therefore the percentage, 4·11, calculated from the former figure, is an erroneous one. The real percentage, 3·94, is also given by Dr. Cameron, but without any indication that the former is untrue, and all the subsequent tables in Part I are affected by this error.

In the case of diphtheria, however, the error is probably larger, though the correct percentage cannot be ascertained from any material given in the report. The former error is too small to sensibly affect any of the conclusions of Part I; but the latter may, quite possibly, invalidate the difference found between hospitals which use the bacteriological test as a routine in discharging cases and those which do not.

The following are the corrected figures, so far as given in the report:—

(1) 658 scarlet fever outbreaks followed on the discharge of 16,702 scarlet fever patients; percentage, 3·94.

(2) 30 scarlet fever outbreaks followed on the discharge of 6,866 diphtheria patients; percentage, ·44.

(3) 73 outbreaks of diphtheria followed the discharge of patients suffering from diphtheria alone, the number of which is not given.

(4) 14 outbreaks of diphtheria followed the discharge of cases of mixed infection.

(5) 55 outbreaks of diphtheria followed the discharge of patients suffering from scarlet fever alone, the number of which is not given.

The discharged patients with mixed infection are not accounted for, but have been returned either under the head of scarlet fever or diphtheria. In the Board's annual reports such cases are returned under the disease from which the patient first suffered. Assuming that Dr. Cameron's returns were compiled on the same principle, some of the 14 cases in group (4) should be allocated to each of the groups (3) and (5). All we can say is that the figures lie between the following limits:—

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[1] Report, Part I., p. 2, and Part II, p. 59 and Tables 20 (b), 21, 22, 23, 24, 25 (p. 72-75).

(3) Diphtheria after diphtheria: between 73 and 87 cases; percentage, between 1·06 and 1·27.

(5) Diphtheria after scarlet fever: between 55 and 69 cases; percentage, between ·35 and ·44.

JOHN MacCOMBIE.
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J. E. BEGGS.
Medical Superintendents.

Office of the Board,
Embankment, E.C.,
April, 1905.

THE END.

6917(411)

METROPOLITAN ASYLUMS BOARD.

REPORT

ON

RETURN CASES

OF

SCARLET FEVER AND DIPHTHERIA

Notified for the Three Years

1902, 1903 and 1904

(WITH FOUR CHARTS).

By F. M. TURNER, M.D.,

Medical Investigator for the Board.

COLLEGE OF PHYSICIANS

1906.

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METROPOLITAN ASYLUMS BOARD,
EMBANKMENT,
E.C.

17th August, 1906.

Dear Sir,

Investigation of Return Cases of
Scarlet Fever and Diphtheria.

Adverting to my letter of the 15th September, 1905, forwarding a report on this subject by Dr. A. G. R. Cameron, I have to inform you that the investigations were continued by Dr. F. M. Turner, who was appointed to succeed Dr. Cameron temporarily as this Board's medical investigator and I have pleasure in enclosing a copy of his report, which covers the years 1902, 1903, and 1904.

Yours faithfully,

T. Duncombe Mann

Clerk to the Board.

The Secretary
Royal College of Physicians
Pall Mall East
W.

London

METROPOLITAN ASYLUMS BOARD.

REPORT ON RETURN CASES

NOTIFIED FOR THE THREE YEARS

1902, 1903, AND 1904.

The following Report is a supplement to that by Dr. Cameron dated March, 1904, and published by the Metropolitan Asylums Board in the following year.

When I was desired by the Special and Medical Sub-Committee to continue the investigation of return cases, I obtained permission to omit the routine visitation of every house in which a return case had occurred, and to devote my time to summarising the material which had accumulated since the end of the period, with which Dr. Cameron's report deals, viz., July, 1902.

The chief object with which I undertook this research was to find out whether the more important conclusions reached by Dr. Cameron would remain unshaken if a fresh set of cases were examined. For the omission of the preliminary house investigation and for the other less important differences between my methods and those of my two predecessors, Professor Simpson and Dr. Cameron, the justification will be found below in the discussion of the various tables.

The following are the most important conclusions arrived at by Dr. Cameron:—

(1) Of the alleged return cases, a moderate proportion were due to coincidence. Of alleged scarlet fever cases nearly one in four were proved coincidences, and of the remainder many were doubtful. The proportion of undoubted return cases was 40 per cent.

In diphtheria the proportion of coincidences was higher than in scarlet fever.

(2) In scarlet fever infecting cases occurred in larger proportion among those discharged from acute than from convalescent hospitals.

(3) A very high proportion of infecting cases, over 50 per cent., when examined after the return case had arisen, showed a discharge from the nose.

(4) A larger proportion of infecting cases was found amongst those scarlet fever patients who were detained from 8 to 12 weeks than among those detained for periods shorter than 8 or longer than 10 weeks.

(5) The infectivity rate varied with the season of the year, and was highest in autumn and winter. Perhaps this effect was due to the weather.

(6) Those hospitals which examined their diphtheria cases bacteriologically before discharge had a slightly lower infectivity rate than those which did not. The difference was not beyond the limits of accidental error.

(7) Return cases had a somewhat higher death-rate than the average.

On all these points, except No. (3), I have summarised the evidence obtainable from the records of return cases for the three years 1902-1904. As to No. (1), my evidence points to a different conclusion from that arrived at by Dr. Cameron. As to Nos. (6) and (7), the results differ in so far that Dr. Cameron found a slight preponderance in one direction, while my figures show a slight preponderance in the other; but agree in so far as the differences found are slight, and in three out of the four instances are insignificant. In regard to Nos. (2), (4), and (5) my results confirm his.

The words "return case" have been used in two senses. In the broader sense they include the whole phenomenon of a second case arising in a house to which a first case has recently been discharged from hospital. The first case is usually called the "infecting" or "primary case"; the second may be called the "infected case," but is more usually called the "return case." To avoid the ambiguity I shall use the term "return outbreak" or, more shortly, "the outbreak," instead of "return case" in the former sense, and "infected case" instead of "return case" in the latter sense.

A return outbreak therefore consists essentially of two cases—an infecting and an infected case; but there may be more than two. Not infrequently the discharge of one patient is followed by the infection of two or more. Rather less commonly the infection of one case is preceded by the discharge from hospital of two or more patients.

500-5-06.

As a rule both infecting and infected cases suffered from the same disease, but not necessarily so. A number of outbreaks are recorded where the discharge of a scarlet fever patient was followed by an outbreak of diphtheria in the house, or *vice versâ*. This phenomenon I shall call "cross infection." Where there are two or more infected cases it frequently happens that all have not the same disease, but some have scarlet fever, some diphtheria. These I shall call "mixed outbreaks." Since outbreaks of scarlet fever and of diphtheria have been tabulated separately in this Report, special care has been given to the classification of these mixed outbreaks. No outbreak has been reckoned as a cross infection which could be classed with the straightforward cases. Thus a case admitted with scarlet fever, who developed diphtheria, and after discharge was alleged to have infected another child with diphtheria, would be included in the diphtheria outbreaks. For certain tables, however, such a case would not be included. In the Annual Reports of the Board a case of diphtheria secondary to scarlet fever is entered in the scarlet fever tables; and in those of my tables where figures are utilised, which were obtained from the Board's Reports, outbreaks due to secondary scarlet fever or diphtheria have been omitted to keep the comparison correct.

Since July, 1901, all return outbreaks, which have come to the knowledge of the medical officers of the various fever hospitals, have been notified on special forms to the chief office and to the medical investigator. These notification forms have formed the foundation of my work.

In almost every case notification has proceeded from the hospital to which the infected case was admitted. In some cases the infecting patient was also discharged from the same hospital, but in very nearly half the outbreaks this was not so. The extent of this crossing in scarlet fever outbreaks is shown in Tables V. and Va. This crossing over from one hospital to another is the chief obstacle that prevents the Board's medical staff from learning by experience in this subject. Plainly the chief interest of an outbreak centres round the infecting, not the infected, case; yet the medical officer who has treated the former is often unaware of the outbreak.

This crossing also made the chief difficulty of my investigation. When both infecting and infected cases belong to the same hospital, the notifications were usually correct ; or, if any error had been made, it was soon detected. But, where two hospitals were involved, the information was often erroneous. Sometimes the name of the infecting patient was not known, sometimes the hospital or the date of discharge were incorrectly given or unknown. Sometimes only the address was known, and since families often change their address while one member is in the hospital, the address to which a patient was discharged may not be that which is entered in the hospital or chief office registers.

A large number of cases, where incorrect information was given, were cleared up; but 23 outbreaks were alleged to be due to discharged patients who could not be traced. The remaining infecting and infected cases were all traced in the hospital or chief office records. The accurate diagnosis was in all cases taken from the hospital. In tracing these a certain number of extra cases were discovered, but not more than one or two belonged to fresh outbreaks. The other extra cases were extra infecting cases or infected cases belonging to outbreaks already reported.

In outbreaks where there were several infecting cases, it is highly improbable that all were really infectious. The occurrence of the outbreak is *prima facie* evidence of the infectivity of one, but not of all. For instance:—

CASE 1093.—Seven children were discharged on June 22nd, 1903, from the Northern Hospital after diphtheria. They belonged to a Poor Law Union School ; and two other children of the same institution were taken ill on June 25th and admitted to the Eastern Hospital with diphtheria on the following day ; a third case was admitted on July 20th.

In the tables I have reckoned wherever possible by outbreaks, not by infecting cases in the sense in which the term is usually used. For instance, the above case is reckoned in Table XI. as one infecting case discharged from the Northern Hospital, not as seven.

In outbreaks, where the infecting cases were discharged from different hospitals or on different days, it is doubtful which of them was actually infecting. The outbreak has therefore been omitted from the table concerned. Thus the following case has been omitted from both Tables VI. and X. as doubtful ; although infection was most probably due to A. W. M., and not M. M.:—

CASE 101.—A brother and sister, A. W. M. and M. M., were both admitted to the North-Western Hospital on October 5th, 1901, with scarlet fever. The former was discharged direct on March 4th, the latter was transferred to the Northern and was discharged on January 7th. On March 13th F. E. C. was taken ill with scarlet fever in the same house.

The total number of outbreaks notified as having occurred subsequent to the discharge of patients who left the hospitals between January 1st, 1902, and December 31st, 1904 (both inclusive) was 1,570.

The following four outbreaks are peculiar, and each has been reckoned both as a diphtheria and a scarlet fever case:—

CASE 5.—Mrs. C. was discharged from the Park Hospital on December 31st, 1901, after diphtheria, and V. C. on January 1st, 1902, from the same hospital after scarlet fever. E. C. was admitted with scarlet fever on January 11th, and F. K. C. with diphtheria on January 13th.

CASE 2013.—Arthur H. was discharged from the Park Hospital on January 23rd, 1904, after scarlet fever and diphtheria. On February 3rd F. H. was admitted with scarlet fever and Alfred H. with diphtheria.

CHART II. INTERVAL IN DAYS OF 160 OUTBREAKS. GROUP B. (DIPHTHERIA AFTER DIPHTHERIA)

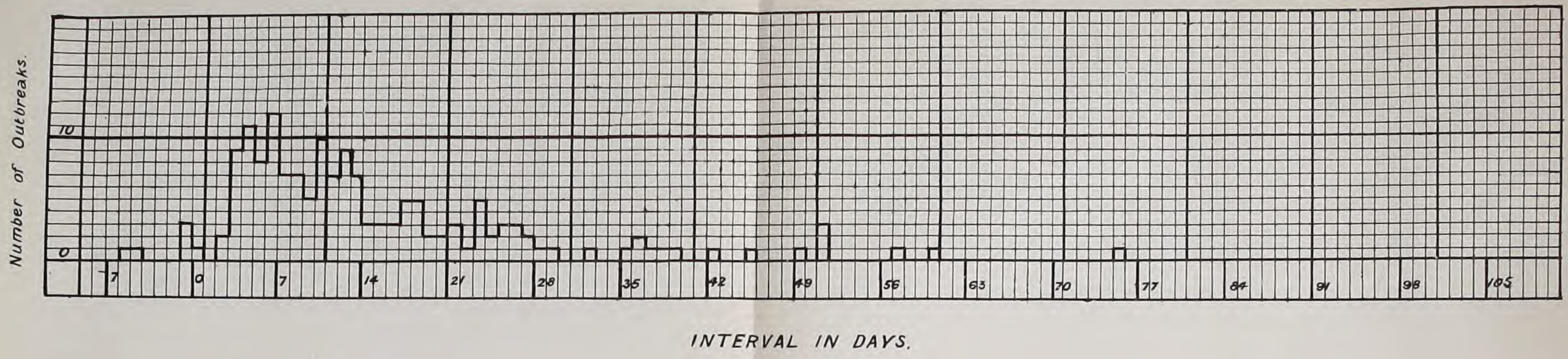


CHART III. INTERVAL IN DAYS OF 93 OUTBREAKS. GROUP C. (DIPHTHERIA AFTER SCARLET FEVER).

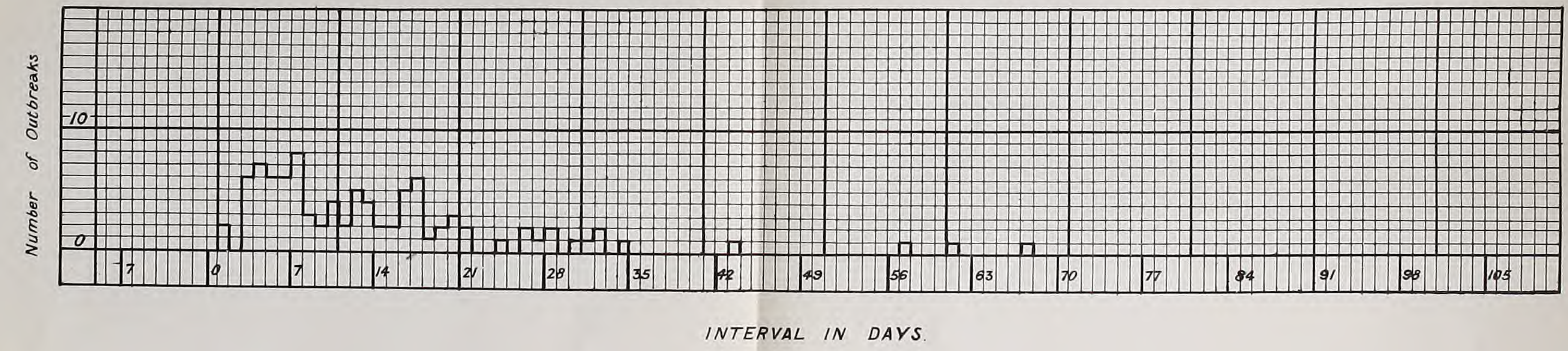


CHART IV. INTERVAL IN DAYS OF 43 OUTBREAKS. GROUP D. (SCARLET FEVER AFTER DIPHTHERIA)

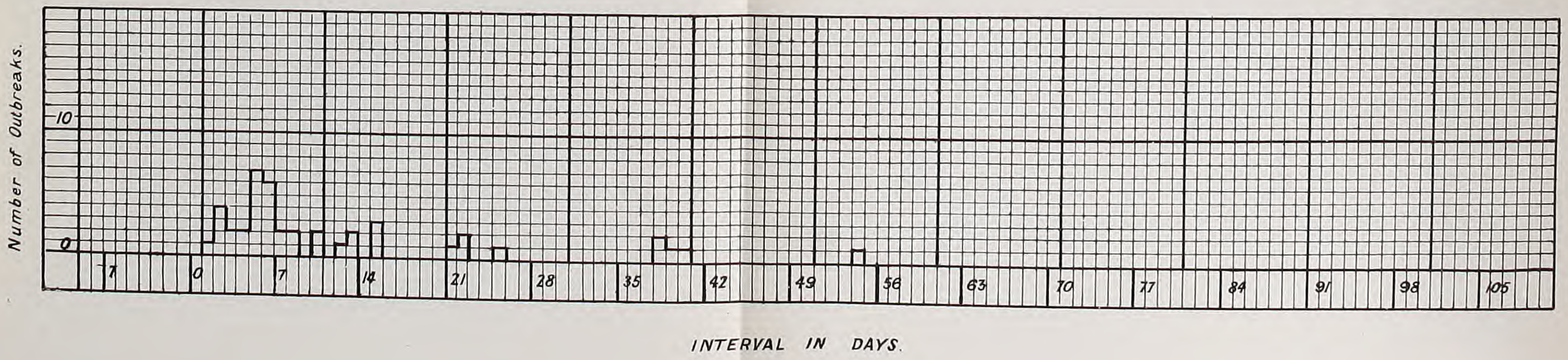
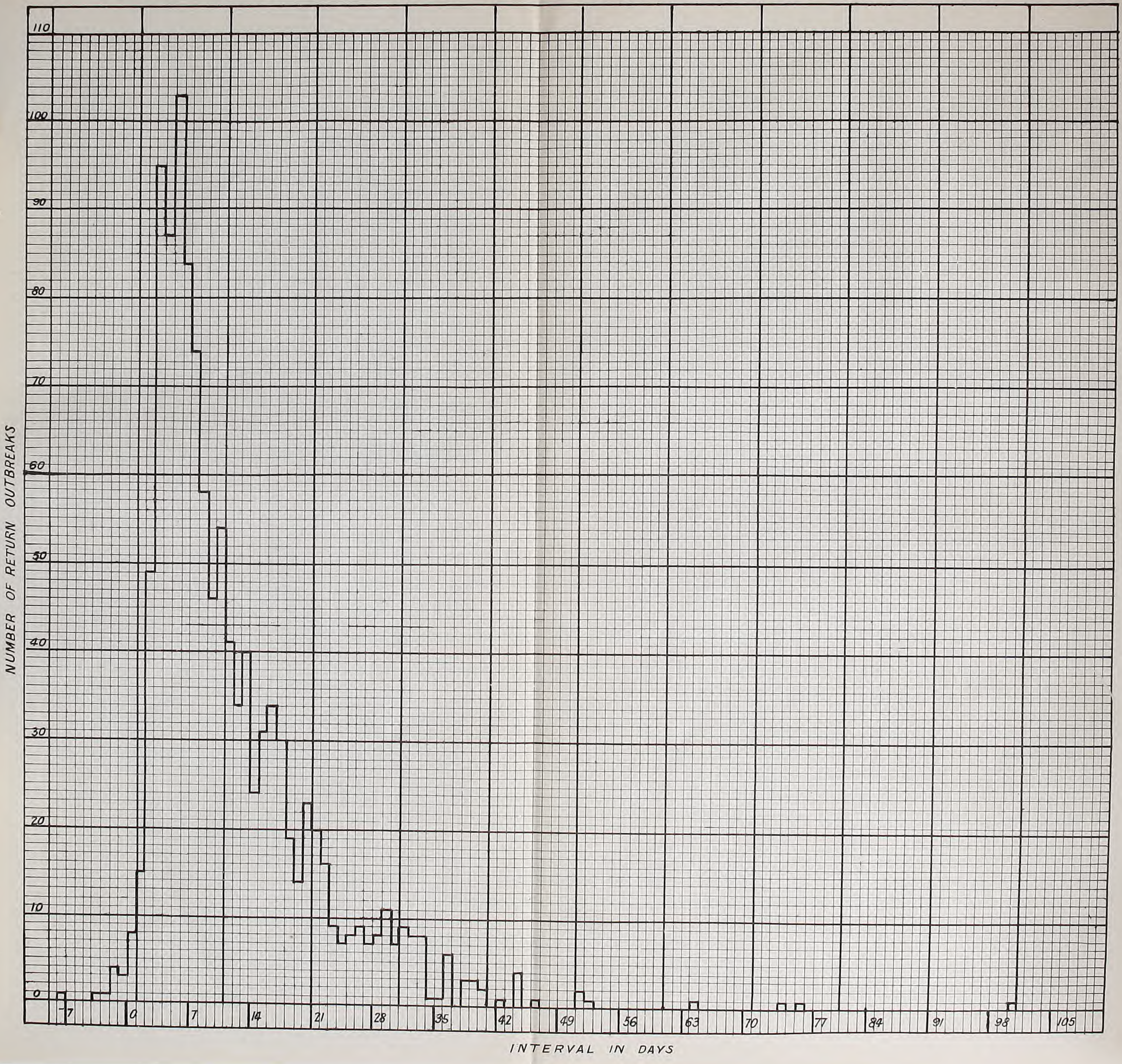


CHART I. INTERVAL IN DAYS OF 1129 OUTBREAKS. GROUP A. (SCARLET FEVER AFTER SCARLET FEVER).



Case 953.—C. A. was admitted to the Park Hospital on January 28th, 1903. On February 15th he developed diphtheria, and he was discharged on March 24th. E. A. and K. A. were admitted with diphtheria on March 31st and L. A. with scarlet fever on April 6th.

Case 2292.—N. K. was admitted to the South-Western Hospital on October 5th, 1904. She developed scarlet fever in hospital and was discharged on December 10th. On December 16th R. W. K. was taken ill and on the 19th was admitted to hospital. The diagnosis made was scarlet fever and diphtheria.

The above outbreaks are entered in the diphtheria as well as the scarlet fever tables, with the exception of the first. Mrs. C. having been discharged before January 1st, 1902, the outbreak of diphtheria subsequent to her discharge belongs properly to 1901, and is outside the period under consideration. This brings the total number up to 1,573.

The 1,573 outbreaks may be classified as follows:—

A. Outbreaks where both infecting and infected cases suffered with scarlet fever (or at least one infecting and one infected case, when there were more than one)	1,176
B. Outbreaks where both infecting and infected cases suffered with diphtheria (three of these have also been included in Class A.)	168
C. Outbreaks of diphtheria following the discharge of a scarlet fever case or cases	101
D. Outbreaks of scarlet fever following the discharge of a diphtheria case or cases	44
E. Outbreaks where the diagnosis of either the infecting or the infected cases was not confirmed in hospital	61
F. Outbreaks which could not be traced in the registers	23
Total	1,573

In the following tables each class is treated separately. Class A. is by far the largest, and the greater part of the following remarks and tables refer to it. Classes E. and F. are not further considered; the latter because no accurate information has been obtained concerning the cases included, the former because the supposition of infection having started from a discharged patient is presumably incorrect.

THE INTERVAL.

Table III. shows the interval that elapsed between the discharge of the infecting case and the origin of the outbreak, the four groups, A., B., C., and D. being treated separately. The same facts are shown graphically on Charts I. to IV. In those instances, where two or more infected cases occurred, the interval is reckoned to the onset of symptoms of the first infected case. In some instances, however, the date of onset not having been noted, the interval has been reckoned from the discharge of the infecting to the admission of the infected case to hospital.

This table gives valuable information as to how many of the alleged return cases were due to other causes than the discharge of the alleged infecting case. In the first place, it is seen that 10 cases of group A. and 5 of group B. occurred with a negative interval. In other words, the infected case was taken ill before the discharge of the infecting case from hospital. In these cases, therefore, the infected case must have contracted the disease from some other source. These cases were coincidences, and as such have not been included in any of the succeeding tables.

But the table shows more than this. Confining our attention to the scarlet fever cases of group A., we see a very pronounced maximum on the fifth day, when there were 103 cases. The frequency is very high on every day from the third to the seventh inclusive, and after the latter day gradually but steadily declines. Since the incubation period of scarlet fever usually lies between two and four days, the table shows definitely that more cases contract infection within two or three days of the discharge of the alleged infecting case than at any other period. By the sixth week the number of cases has declined to an average of less than two per diem, and after that to less than one per diem. This seems to me conclusive evidence against ascribing any large number of the return cases to coincidence.

Any cause such as presence of scarlet fever in the school attended by the return case, or in the immediate neighbourhood of the house, or any insanitary conditions of the house, acting through a series of years in a large area like the Metropolis, must bring about outbreaks in houses to which fever patients have been discharged with approximately equal frequency in the tenth week after the discharge as in the first or second. But in Table I. only one case occurs in the tenth week and 441 in the first. Assuming that the solitary case in the tenth week was a coincidence, we have a right to assume that one or two cases out of the 441 were also coincidences; also that the vast majority were not coincidences but were casually connected with the alleged infecting case.

I expect the objection to be raised that my two predecessors both arrived at a different result, and that they both investigated all cases on the spot before coming to any conclusion. Prof. Simpson ascribed 36 per cent. of his cases to other causes than the alleged infecting case; and Dr. Cameron ascribed 22·5 per cent. In addition, both observers class a large number of cases as doubtful. And some may prefer to accept their estimates to mine on account of their conclusions having been formed on the spot, not by a statistical investigation.

I think this argument is unsound, for investigation at the houses can only give a definite answer to the two questions:—

> 1st. Was the return case exposed to infection from the alleged infecting case? In other words, did the two patients meet?
>
> 2nd. Was the return case exposed to any other source of infection, such as scarlet fever, in the same school, or in houses which the child had visited, or was he exposed to infected clothes or toys?

If both these questions are answered in the affirmative, the cause of the outbreak is doubtful, and no further evidence that can be obtained will definitely exclude either source. Apart from the present investigation, it has been my duty to investigate and write reports on certain return cases, and in doing so I have judged each case on the evidence obtainable. For instance, in an outbreak where the supposed infecting case had nasal discharge, I considered him to have been probably infectious; on the other hand, where he was free from all recognisable signs of a previous attack of fever, and where a long interval had elapsed between the discharge of the first case and the illness of the second, I judged him to be probably non-infectious; and if in such a case an independent source of infection came to light, I attributed infection to the latter.*

In this, however, probability only is obtained, not certainty. For statistical purposes it is safest to include all alleged cases in the tables, even though some appear probably coincidences. To collect cases, and sort out a certain number as presumably "false" cases because of the absence of mucous discharge or other signs of infection, or because of the long interval, and then to make tables of the remaining cases to show the infectivity rate of cases with mucous discharge, or to show the distribution of the interval in a number of outbreaks, involves the fallacy of reasoning in a circle. The only exception I have made is in those cases where infecting and return cases have not met, which are demonstrable "false" cases.

The above argument does not apply to infection from undisinfected clothes or toys, for it is usual for the patients' clothes to be packed away soon after his removal to hospital, and to be brought out again in anticipation of his return. Such outbreaks would naturally take place soon after the return of the first case from hospital. Neither Simpson nor Cameron, however, attribute a large number of outbreaks in this cause. Simpson gives 17 scarlet fever outbreaks,† or 10 per cent. as certainly due to either clothes or house infection, and a further 12 cases,† or 7 per cent., as possibly due to undisinfected clothing.

Cameron gives no figures, but publishes details of certain illustrative cases. His remarks on page 37 of his report show that he does not attribute very much importance to this cause.

In group B., diphtheria outbreaks occurring after the discharge of a diphtheria patient, the crowding of the cases into the first and second weeks is not so marked as in group A. Still, there is a definite scarcity of outbreaks more than 28 days after the discharge of the infecting case. The same argument, therefore, applies as in the case of scarlet fever, though not with equal force. In groups C. and D. also there is a definite crowding of cases into the first three or four weeks. One would have supposed that the fact that infecting and infected cases did not suffer from the same disease was sufficient to disprove any causal connection between the two. The table, however, shows that there was such a connection, and in these two groups the hypothesis of clothes' infection is inadequate to explain the outbreak. No doubt some such outbreaks are mere coincidences, but not the majority. For if 50 per cent. were due to causes independent of the discharged patient, the clustering of the cases in the first weeks after discharge could not occur to the extent observed.

The consideration of these facts shows that in group A. coincidence can only account for a small proportion of the outbreaks recorded. Although infection from clothes is not included among coincidences, I think it probable that both causes together do not account for more than 10 per cent.

MORTALITY OF RETURN CASES.

The case mortality among the 1,442 infected cases of group A. (scarlet fever after scarlet fever) was 3·13 per cent. That among all scarlet fever cases completed during the three years 1902–1904 was 3·29 per cent. Dr. Cameron found a higher proportion of deaths among return cases than among ordinary scarlet fever cases. This, however, is seen not to be an invariable phenomenon.

Table IV. shows the number of deaths among infected cases of groups A., B., C. and D., with the case mortalities, compared with the case mortalities of the total scarlet fever or diphtheria cases completed during the three years. In two groups the return cases show a large mortality, and in one a smaller. The differences are probably due to chance.

---

* Professor Simpson attached weight in a number of cases to the argument, that a child A., who was alleged to have infected B., could not really have carried infection if he had slept with another child or children, C. and D. (who had not previously had scarlet fever) and had not infected the latter. Such an argument could not convince anyone who had worked in a fever hospital, and known how many cases contract fever only after several weeks' exposure to infection.

† These cases have been counted from the appendix, and are not found in the body of his report.

GROUP A.—SCARLET FEVER FOLLOWING THE DISCHARGE OF A SCARLET FEVER CASE.

The total number of outbreaks originating in patients discharged during the three years 1902–1904 was 1,176. The total number of "infecting" cases was 1,262, and the total number of "return" or "infected" cases was 1,442. The details of multiple "infecting" or "infected" cases will be found in Table II.

The total number of scarlet fever discharges for the same three years, as given in the Annual Reports of the Statistical Committee, was 35,516. This, however, includes only cases of primary scarlet fever. The cases of diphtheria, who contracted scarlet fever subsequently, and were discharged during the same period, are not given in the reports. I estimate the number, however, at about 750; so that the total scarlet fever discharges, primary or secondary, during this period were about 36,270. The infectivity rate among these patients was, therefore, 3·33 per cent.

A more correct figure can be obtained by neglecting those cases, 34 in number, where the infecting case contracted scarlet fever secondary to diphtheria. There remain 1,142 outbreaks. Of these, however, 10 occurred before the discharge of the alleged infecting case. These are certainly coincidences. There were therefore only 1,132 outbreaks following the discharge of a primary case of scarlet fever.

The number of such discharges was 35,516, but since notification of return cases from the North Western Hospital was incomplete during 1903 and in abeyance during 1904, I have subtracted the discharges from that hospital during these two years, leaving 34,601.

The percentage of outbreaks of scarlet fever among these discharged cases was, therefore, 3·27.

In all the tables except I. II., III., IV., and V., only primary scarlet fever cases have been included, because the figures for the patients discharged after secondary scarlet fever cannot be obtained from the Annual Reports.

THE OCCURRENCE OF INFECTING CASES AT THE VARIOUS HOSPITALS.

Table II. shows the number of infecting cases discharged from each hospital in each year, also the infectivity rate. It will be noticed that the rate at any one hospital varies from year to year as might have been expected *à priori.*

It is not therefore possible to lay much stress on the comparison between single hospitals for single periods. On the other hand, there is a certain amount of consistency of the figures for the same hospitals throughout the three years. At four hospitals, Grove, South Eastern, Park and Brook, the rate persisted above the average for the whole period. At the Northern the rate was persistently lower than the average. It is impossible, therefore, to attribute the whole of the differences between different hospitals to accident.

The most striking difference to be deduced from Table II. is that between the acute and convalescent hospitals.

TABLE A.

	Total Scarlet Fever discharges.	Infecting cases.	Infectivity rate. per cent.
Acute Hospitals	24,006	900	3·75 ± ·08
Convalescent Hospitals	10,595	213	2·01 ± ·09
Total	34,601	1,113	3·22

I have also arranged the figures of Table II. to throw as much light as possible on the infectivity of desquamating cases, also on the efficacy of various systems of classification in reducing infectivity.

At several hospitals desquamating cases are not always detained, and the practice of discharging cases desquamating has increased of late years. If late desquamation were infectious, we ought to find a higher rate at these institutions than at the others. At only one were cases sent home regardless of desquamation; at the others either few or many were discharged peeling, but no exact numbers are recorded.

I have arranged the different hospitals and years into groups, according to information supplied to me on this point, though that is necessarily somewhat vague.

TABLE B.

Hospital and Period.	Total Scarlet Fever discharges.	Infecting cases.	Infectivity rate per cent.
Group I.—All cases detained until peeling was complete—			
N. W. H., 1902	892	39	
F. H., 1902-3	2,305	75	
B. H., 1902-3	2,967	132	
Total	6,164	246	3·99 ± ·17
Group II.—Nearly all cases detained until peeling was complete—			
N. E. H., 1902-3	2,902	85	
S. E. H., 1902	472	18	
B. H., 1904...	1,109	40	
F. H., 1904...	456	13	
Total	4,939	156	3·16 ± ·17
Group III.—Some cases discharged peeling—			
E. H., 1902	139	4	
N. E. H., 1904	1,393	32	
W. H., 1902-4	2,320	73	
S. W. H., 1902	944	34	
G. H., 1902-4	1,752	80	
P. H., 1902-4	4,230	187	
Total	10,778	410	3·80 ± ·12
Group IV.—Many cases discharged peeling—			
S. W. H. 1903-4	1,415	47	
S. E. H. 1903-4	446	22	
N. H. 1902-4	10,139	200	
Total	12,000	269	2·24 ± ·09
Group V.—Cases discharged irrespective of peeling of the skin—			
E. H. 1903-4	720	26	3·62 ± ·47

In group IV. the Northern Hospital discharges preponderate. If it is desired to keep the comparison to Acute Hospitals only, we can use the following modified totals.

Total 1,861 69

Infectivity rate, 3·71 ± ·29 per cent.

If the Fountain Convalescent Hospital be excluded similarly from Group II. the infectivity rate becomes 3·19 ± ·18 per cent.

It will be seen that there is no connection between a high infectivity rate and a high proportion of peeling cases discharged. The highest rate occurs in Group I., or those hospitals which were most consistent in detaining cases until peeling was complete. If we confine our attention to the acute hospitals the rates all lie between 3·19 and 3·99, and are little beyond the limits of accidental variation.

The above figures are, therefore, what we should expect if late desquamation has no relation to power of conveying infection. If any such connection exists it must be insignificant in amount.

The terms "nearly all," "some," and "many," used in defining the intermediate groups are not precise, and it is quite probable that some hospitals in group II. discharged as large a proportion of peeling cases as those in group III., or even a larger proportion. This does not destroy the value of the evidence, for the same conclusion is reached if we compare only the extreme groups I. and V., as regards which the difference in practice is beyond any doubt.

In regard to classification of cases, three distinct systems have been tried. A discharge ward was used at the North Eastern only, and only during 1904. Acute and convalescent patients were as a rule treated separately at both the North Eastern and Park; this rule, however, did not apply to the cot wards. At the Brook a plan was adopted intermediate between these two. Female scarlet fever cases under 12 years old were isolated for a week preceding discharge.

Unfortunately this plan only came into force towards the end of 1904, and I have accordingly reckoned the Brook Hospital amongst those where patients were not classified. At the Fountain the separation of mild acute cases from severe acute cases has been carried out.

In the following table I have contrasted those acute hospitals, where one or other of the above systems has been carried out, with those where patients were discharged direct from acute wards:—

TABLE C.

	Total Scarlet Fever Discharges.	Infecting cases.	Infectivity Rate per cent.
Group I.—Hospitals adopting some system of classification.—N. H., E. H., P. H. and F. H.	10,830	379	3·50 ± ·11
Group II.— Other acute hospitals	13,176	521	3·95 ± ·11
Total	24,006	900	3·75

In respect to the evidence for particular methods of classification we got the following tables:—

	Total Scarlet Fever Discharges.	Infecting Cases.	Infectivity Rate per cent.
TABLE D.			
Acute hospital using a discharge ward (N. E. H. during 1904 only)	1,393	32	2·29
Acute hospitals not using a discharge ward	22,613	868	3·83
Total	24,006	900	3·75
TABLE E.			
Hospitals having separate acute and convalescent wards (N. E. H. & P. H. only.)	8,525	304	3·57
Other acute hospitals	15,471	596	3·86
Total	24,006	900	3·75
TABLE F.			
Acute hospital using separate acute wards for mild and severe cases (F. H. only.)	2,305	75	5·24
Other acute hospitals	21,701	825	3·80
Total	24,006	900	3·75

From these tables we see that those hospitals which adopted some method of classification had a lower infectivity rate than the remainder, and it is also true that with each of the three systems that have been adopted a slightly lower rate than the average was obtained. The evidence in favour of classification, however, is by no means strong.

The differences are small in all the tables. It will be noted also that two systems of classification were adopted only at one hospital each; it is quite possible that some one out of the many known or unknown influences which cause a difference between the infectivity rates at any two hospitals has been at work causing the observed differences. In Table E., in which two hospitals adopted the same system of classification, the advantage in infectivity rate is less than in either of the other two tables which refer to systems less extensively used.

The good effect of classification, therefore, is not great. The difference of infectivity rate in favour of those hospitals which adopted it is not so large as the differences between hospitals which do not adopt any classification at all.

In comparing the results of different hospitals in relation to differences of routine or treatment we tacitly assume that the cases at different hospitals are comparable in all other respects. The differences between the class of cases treated at the different hospitals are certainly small; but are they competent to produce the observed differences of infectivity rate, which are also small quantities? In Cameron's report, and at greater length in the Appendix written by the

Medical Superintendents, two such differences are considered, viz., the effect of selection of cases for transfer and the effect of the different districts to which patients belong.

In Table VII. I have followed the method adopted by the Medical Superintendents in the place referred to above. The cases that were transferred from each acute hospital to the Northern or Fountain have been followed up and a note made whether or not they proved infective. The table shows the total number of discharges, direct or indirect, from each acute hospital and the number of these which gave rise to outbreaks. In 128 instances patients transferred from an acute hospital to a convalescent were afterwards admitted to an acute hospital (not necessarily the original one) before discharge. A certain number of cases were also transferred from one acute hospital to another. In Table VII. all such cases have been entered under the hospital to which they were originally admitted.

This method of enumeration would cancel any influence on the infectivity rate caused by conscious or unconscious selection of cases for transfer.

In the table we see that the Park and Brook transferred too few cases to have much effect upon their rates. The other hospitals, except the Western, all show a lower rate on their total discharges than on their direct discharges only. This is due to the lower rate of transferred cases generally. Allowing for this, we see that the South Eastern and Eastern hospitals have an appreciably lower rate on their total than on their direct discharges, the Western a higher rate. The other rates are not much altered.

As regards the allocation of parishes to the different hospitals my investigation is not yet complete. In the observations of the Medical Superintendents on Cameron's report it was shown, however, that this allocation had a large influence on the infectivity rate.

It is therefore necessary to accept the results of such tables as C. to F. with some caution. I would point out, however, that they are the only evidence at present available, and that, as we do not know in what direction the disturbing influences really tend, the results should be accepted until better can be obtained.

This place is suitable for drawing attention to one other disturbing factor. The omission of notification at the North Western Hospital in 1904 and part of 1903 is not entirely neutralised by omitting that hospital from consideration. Owing to the crossing of hospitals it is probable that some infecting cases discharged from the Northern and North Eastern hospitals, and perhaps others also, caused outbreaks which have not been reported owing to the infected case having gone to the North Western. During 1902, however, when notification was carried out at the North Western as elsewhere, 10 North Eastern and 13 Northern infecting cases were notified. If we allow an equal number of "crossed cases" for each of the years 1903 and 1904 we shall probably over-estimate the error due to this cause. It will be seen, therefore, that the low infectivity rates of these two hospitals is not due to the omission of a few cases that should have been notified at the North Western.

PERIOD OF DETENTION.

Table VIII. shows the period of detention in 1,085 of the infecting cases. In the remaining 47 outbreaks two or more infecting cases were concerned who had been detained for different lengths of time. Since it is doubtful which of the two was really infectious, such outbreaks do not appear in this or the following table.

This table by itself is not very instructive; it only shows that the majority of infective cases were discharged between the seventh and eleventh weeks inclusive. What we really want is to compare the number of infecting cases with those that are not infecting, or with the total, for each period of detention.

To obtain the latter figures for the years 1902 and 1903 would have involved the compilation of the whole of the bed-cards for those two years, a task which would have taken more time than I or my clerk could afford. For the year 1904, however, certain manuscript returns were available which much reduced the labour, and from these Table IX. was compiled.

From this table it will be seen that the infectivity rate is greater than the average in cases discharged after a detention of six, seven, eight or nine weeks. Or that there is more risk of infection arising from patients discharged then than those discharged after either a shorter or longer period. This conclusion confirms that arrived at by Cameron.

In one respect the above comparison is unsatisfactory. In order to estimate the effect of short or long detention on the infectiousness of patients after discharge, we want a table of infectivity rates similar to the above, in which all patients were of the same type; or, if not, all types occurred equally in the different groups. The above figures, both my own and Cameron's, fail in this; for there is no doubt that those patients who were discharged after six weeks were very different in some respects from those discharged after twelve weeks.

To get over this difficulty I have obtained particulars of 1,000 consecutive scarlet fever cases from the registers of the Eastern Hospital. In every case the period of detention and all complications were noted. Cases from one hospital only were used, because the difference in noting certain complications, especially rhinorrhœa, by different observers, is thus as far as possible avoided. I chose the Eastern Hospital because Dr. Goodall has paid special attention to noting slight cases of rhinorrhœa. My list of cases in part coincides with those on which Goodall founded his paper in the Supplement to the Board's Reports for 1904, but no fatal cases are included in my list. In all cases which were transferred I have had the Northern Hospital register examined in order to enter any complications that arose there.

The results as regards return outbreaks following these 1,000 cases differ in more than one respect from those obtained from the much larger number already dealt with, as is seen on comparing Tables XX. and XXI., or IX. and XIX. This is unfortunate, since it renders it uncertain how far we can trust the experience of the Eastern Hospital during this period as a guide to the whole.

Twenty-two outbreaks of scarlet fever and one outbreak of diphtheria were notified as occurring after the discharge of these 1,000 cases. The scarlet fever outbreaks include 26 "infecting" cases. Of these, however, nine were doubtful, two or more cases having been discharged to the same house. In each of two outbreaks two cases were discharged from the Eastern either directly or after transfer. In three other outbreaks children from the Eastern and North Eastern Hospitals were discharged to the same house.

Since the omission of the doubtful cases causes a perceptible variation in the percentages among so small a number, the following figures have been calculated twice; firstly including and secondly excluding the doubtful cases.

Tables XVIII. and XIX. show the facts as regards period of detention and proportion of infective cases among these 1,000 cases. The experience of the Eastern differs from that of the average of all the hospitals, in that with one exception no case proved infective which was detained over ten weeks. The average detention of Eastern Hospital infecting cases was ten days less than that of infecting cases from the whole of the Board's hospitals during 1904.

In Table XIX. the cases have been grouped into three classes, uncomplicated cases, cases with rhinorrhœa, and cases with complications other than rhinorrhœa. In each group a higher infectivity rate is seen among patients discharged at the earlier periods. How far the experience of these 1,000 cases may be taken as applicable to other hospitals and other periods is doubtful, seeing the large discrepancy between the figures of Tables XIX. and IX. in respect of cases detained over ten weeks.

Table XX. shows the comparison between infecting and non-infecting cases for all the hospitals arranged in a different way, the mean period of detention of each being shown; and Table XXI. shows the same with respect to the Eastern Hospital 1,000 cases.

It will be seen from these tables that the mean detention of infecting cases is lower than those not infecting.

CLINICAL CONDITION OF INFECTING CASES

In Simpson's and Cameron's reports a high percentage of the infecting cases are shown to have had rhinorrhœa when examined after the return outbreak. Cameron, however, found that in more than half the cases the discharge had appeared for the first time after the patient left the hospital.

From the point of view of the medical officer of an infectious hospital, it is more important to know the proportion of infecting cases among those who showed a discharge while still in the hospital. Do those cases which have suffered with rhinorrhœa in hospital prove infective in greater proportion than those which have not? In the Eastern Hospital 1,000 cases the proportion was almost identical in the two groups.

TABLE G.

	Cases which suffered with rhinorrhœa in hospital.	Other cases.
Infecting cases (including those doubtful) ...	9	17
Total cases	343	675
Rate per cent.	2·62	2·52
Infecting cases (excluding those doubtful) ...	5	12
Rate per cent.	1·46	1·78

The following table shows the infectivity rate among five groups into which the 1,000 cases have been divided:—

TABLE H.

	Total cases.	Including doubtful cases.		Excluding doubtful cases.	
		Infecting cases.	Infectivity rate.	Infecting cases.	Infectivity rate.
Uncomplicated cases	397	13	3·3	8	2·0
Cases with rhinorrhœa	269	8	3·0	3	1·1
Cases with otorrhœa	43	0	0·0	0	0·0
Cases with both rhinorrhœa and otorrhœa ...	74	1	1·35	0	0·0
Cases with other complications	217	4	1·8	4	1·8
Total	1,000	26	2·6	15	1·5

The high rate among the uncomplicated cases was unexpected, and it is possible that a further series of cases might not show the same result. The point deserves further investigation. If return outbreaks were regularly notified to the hospital responsible for the discharge of the infecting case so that the superintendent could rely on having a complete, or fairly complete, list of infecting cases, the preparation of tables, similar to the above, would be easy, and would probably clear up several doubtful points.

SEASONAL INCIDENCE.

TABLE X. shows the seasonal incidence of return outbreaks (Group A). Taking the totals for the three years it will be seen that the maximum number of outbreaks were recorded in January and the minimum in June. The maximum infectivity rate occurred in February and the minimum in June. The figures agree with those compiled by Dr. Cameron in showing a high winter and low summer prevalence, but differ in showing a maximum incidence and infectivity rate respectively two and three months later than that found by him.

It seems probable that this seasonal variation is due to the weather, as suggested by Dr. Cameron. During inclement weather a larger proportion than usual of the patients contract a cold on the way home; and such colds are probably capable of conveying scarlet fever infection. In compiling the list of cases on which my tables are based I was struck with the fact that in several instances three, four or more infecting cases were discharged on the same day, while on other days no infecting cases were discharged. It seemed possible that the former days were characterised by inclement weather, either wet or cold, and this point I have investigated as follows. For each day of the year 1904 the total scarlet fever discharges of all Metropolitan Asylums Board hospitals was extracted from the chief office records. The number of infecting cases discharged on each day was then entered. Finally, the mean temperature, the rainfall, the direction and velocity of the wind, and the difference of the temperature of that day from the average of the past 50 years were entered from the reports of the Register-General. By grouping together all days with a heavy rainfall and all with a moderate rainfall or none, we can test the connection between rainfall and high infectivity rate, and similarly for the other factors.

The result of this investigation, which involved a good deal of labour, was negative. The figures for the three months from January to March inclusive were examined in respect of each of the following: (1) Temperature above or below the average, (2) rainfall, (3) direction of wind, and (4) velocity of wind. Only the direction of the wind shewed any connection with the infectivity rates. Thus in Table XV. it was seen that the infectivity rate among patients discharged during the existence of easterly winds was 4·5 per cent., while that for days when the wind was northerly, westerly or southerly was 2·6, 1·2 and 3·0 per cent. respectively. When, however, the figures for the whole year were examined this excess of infecting cases connected with easterly winds on the day of discharge disappeared. The figures were:—

Wind, easterly. Infectivity rate	2·96
,, northerly ,, ,, ...	2·54
,, westerly ,, ,, ...	1·93
,, southerly ,, ,, ...	3·09

In the light of these figures it does not appear probable that return outbreaks would be appreciably reduced in number, by detaining patients in hospital, when the weather turns out inclement, either wet or cold, or windy, on the day fixed for their discharge.

The periods dealt with in this and in Cameron's reports overlap for seven months—January to July, 1902, inclusive. The figures given on page 21 of Cameron's report for these months are in every case smaller than those in my table. Cameron's figures for the seven months give a total of 351, which is 47 in excess of the corresponding total in Table X. The difference is probably due to our different methods. My 304 outbreaks contained 342 infecting cases, which accounts for a difference of 38. In addition, I have excluded from Table X. four outbreaks subsequent to secondary scarlet fever, and two in which the interval was negative. The remaining three cases I am unable to account for. Possibly they remain among my Group F., or Cameron may have obtained information from sources unknown to me. The greater portion of the discrepancy, however, is due to my tabulating outbreaks instead of infecting cases.

This shows that in comparing Cameron's results and my own an allowance should be made. It would would not be safe to argue from a drop in the infectivity rate unless the drop exceeds one in ten.

GROUP B.—DIPHTHERIA FOLLOWING THE DISCHARGE OF A DIPHTHERIA CASE.

The total number of diphtheria outbreaks recorded after the discharge of diphtheria patients who left the hospitals between January 1st, 1902, and December 31st, 1904, inclusive, was 168. Five of these were demonstrable "false" cases, having occurred before the discharge of the alleged infecting cases. In six of the remainder and one of the false cases the infecting case suffered from scarlet fever and post-scarlatinal diphtheria. There remain, therefore, 157 outbreaks possibly due to the discharge of a primary diphtheria case.

The number of primary diphtheria cases discharged during the same period was 15,105. If the cases discharged from the North Western Hospital during 1903 and 1904 be subtracted (see p. 5) the discharges were 14,262. Accordingly 157 outbreaks followed on 14,262 discharges, an infectivity rate of 1·10 per cent.

Table XI. gives the total discharges of primary diphtheria cases, and the number of return case outbreaks for each hospital for each of the three years and for the whole period. The infectivity rates are only given for the three-year period, since the numbers are so small and irregular.

Table XII. compares the infectivity rate for all hospitals, in which a bacteriological test is made a routine practice before discharging patients, with that for the remaining hospitals. Two hospitals, the Eastern and North Eastern, have changed their practice during the period under review. The figures for these two hospitals have been dissected accordingly. It will be seen that the infectivity rate for the former group is slightly greater than that for the latter. Although we should expect *à priori* that the bacteriological examination would give increased protection against the discharge of infecting cases, we see that the actual results of three years' working do not confirm this view.

Table XIIa. was drawn up to avoid an objection, which occurred to me, to the figures of the preceding table. On pp. 201 to 204 of Cameron's Report it is shown that considerable influence on the infectivity rate of a hospital is exerted by the district from which it draws its cases. It seemed possible, therefore, that among the six acute hospitals which did not change their practice, the Grove, South Eastern, and Brook may have drawn from "bad" districts and the remaining three from "good" districts. Such an influence, if it existed, would tend to neutralise the good effect of the extra precautions taken at the three hospitals, and, since the districts attached to each hospital are in the main permanent, the same results would be obtained year after year. But if we compare the results of the same hospitals at different times, as is done in Table XIIa., the above objection does not hold. This table, however, shows a similar result to the former. The two hospitals which adopted the extra precautions have not experienced an increased immunity from infecting cases, but the reverse.

The details of the bacteriological examination differ at different hospitals. At the South Eastern one negative culture was deemed sufficient. At the North Eastern five negative cultures —three from the throat and two from the nose—are required. In spite of this, however, the infectivity rate at the latter hospital has risen since the adoption of the above routine.

CROSSED INFECTION. GROUPS C. AND D.

On page 4 it is shown from the length of the interval in these outbreaks that at any rate a considerable number of them are really due to the alleged infecting case.

The number of outbreaks of diphtheria following the discharge of a scarlet fever patient was 101, which is equivalent to 0·28 per cent. upon the 35,516 scarlet fever discharges; and the number of outbreaks of scarlet fever following the discharge of a diphtheria patient was 44, equivalent to 0·29 per cent. upon the 15,105 diphtheria discharges. Strictly, however, we should add to these numbers certain mixed outbreaks which have already been counted in Groups A. and B. In twelve outbreaks following the discharge of a scarlet fever patient two or more infected cases were taken ill, one or more with diphtheria and one or more with scarlet fever. Similarly five outbreaks following discharge of a diphtheria patient contained both scarlet fever and diphtheria among the infected cases. Adding these we find 113 diphtheria outbreaks after the discharge of scarlet fever cases, or 0·32 per cent. on the total discharges; and 49 scarlet fever outbreaks after the discharge of diphtheria cases, or 0·32 per cent. on the total discharges.

In a few of these outbreaks the original case was readmitted.

CASE 227.—E. S. was discharged from the Park Hospital on March 26th, 1902, after scarlet fever. On April 6th she was again ill and on the 8th was admitted to the Brook Hospital with diphtheria. Her brother, G. S., was admitted to the Brook Hospital on the 9th and is said to have been taken ill on the 6th.

Here it is plain that E. S. and G. S. both contracted diphtheria from some unknown source, since both were taken ill on the same day. However, all similar outbreaks cannot be put down as certain coincidences, for many cases have been recorded where a patient discharged from hospital after scarlet fever has been readmitted a few days later with diphtheria.

The following is an instance of the converse, scarlet fever after diphtheria, the original case being readmitted:—

CASE 332.—W. U. was discharged from the Park Hospital on May 31st, 1902, after diphtheria. D. M. U. was taken ill on June 6th and admitted to the Park Hospital on the 7th with scarlet fever. W. U. was also taken ill with scarlet fever on the 14th and admitted the same day.

RECURRENT OUTBREAKS IN THE SAME HOUSE.

A return case is essentially a recurrence of infectious disease in a house after the return of a patient supposed to be cured and free from infection. There are several instances, however, recorded during the three years where the second or infected patient again started the disease after his or her discharge, thus proving an infecting case in turn.

In all, there were 26 such cases of recurrence; in 25 of these, two return outbreaks, and in one, three outbreaks occurred in succession. One outbreak, however, out of the 25 was a demonstrable coincidence. A complete list of these cases is given in Table XXII. Cases 118 and 725 are peculiar, in that the infecting case of the first outbreak afterwards became infected in the second outbreak. A parallel case occurred under my care in 1901, and is quoted by Cameron in his report (p. 46, case 8).

In 17 of the recurrent outbreaks all the patients suffered with scarlet fever; in two all suffered from diphtheria. In the remaining 7 (including the false case) the diseases were crossed.

However return cases are caused, we should expect a certain number of recurrent outbreaks, if the numbers dealt with are sufficiently large. If 3 per cent. of primary scarlet fever cases are infectious after discharge, we should expect 3 per cent. of the infected cases to give rise to a further outbreak, if the conditions remained the same. The same would be true if return outbreaks were simply coincidences. On the discharge of the 1,442 infected scarlet fever cases we should therefore expect about 45 recurrent outbreaks. The reason that only 17 are recorded is probably that the conditions are not the same in the two outbreaks. In families containing only two children, the first outbreak leaves no further cases to be infected, and in families of three or four, all may be infected at the first outbreak, or the one or two who escape may be insusceptible.

Apart from true recurrence, a few instances are recorded of two outbreaks in the same house, which apparently were quite unconnected.

CASES 583 and 642.—R. L. of 45, Eden Grove, Islington, was admitted to the North-Eastern Hospital on April 22nd, 1902, and discharged from the Northern on June 25th. M. L. was taken ill on July 1st and admitted to the North-Eastern on the 2nd. E. M., of the same address, was admitted to the North-Western on May 2nd and discharged on July 15th. M. M. was taken ill on July 17th and admitted to the North-Eastern on the 18th. All four cases had scarlet fever.

CASES 668 and 603.—F. E. B., of 67, Latimer Road, W., was admitted to the Western Hospital on October 15th, 1902, and discharged on December 1st. A. A. B. was taken ill on December 12th and admitted to the Western on December 14th. C. B. was admitted to the Western on November 14th and discharged on December 31st. A. J. B. was taken ill on January 4th, 1903, and admitted to the Western on the 6th. The two former patients had diphtheria, the two latter scarlet fever, thus emphasising the independence of the two outbreaks which the dates alone make probable.

CASES 219, 346 and 346A.—J. C. was admitted to the Brook Hospital from Manor Farm, Lee, on January 7th, 1902, with diphtheria and was discharged on April 2nd. On April 5th F. C. was taken ill and admitted to the Brook on the 6th with scarlet fever. T. J., a member of another family but living at the same address was also admitted to the Brook with diphtheria on January 26th and discharged on April 2nd. On April 7th his brother, L. J., was taken ill and admitted to the Brook with diphtheria on the 8th. So far this case is similar to many other mixed outbreaks; but the further course is interesting in that F. C. and L. J. both proved infecting after their discharge; in each case the infection was confined to his own family, and since one outbreak was scarlet fever the other diphtheria the outbreaks were probably independent. L. J. was discharged on May 29th and his sister, K. J., was taken ill on June 13th and admitted to the Park Hospital with diphtheria. F. C. was discharged on June 14th and his brother, A. C., was admitted to the Brook with scarlet fever on June 20th, having been taken ill the same day.

SUMMARY.

The chief conclusions to be drawn from this investigation are:—

(1) The alleged return cases include some coincidences as well as true cases, but the proportion of the former is small. Among scarlet fever outbreaks arising after the discharge of scarlet fever cases, the proportion is probably less than 10 per cent. Among diphtheria outbreaks following diphtheria, and in outbreaks where the diseases are different, the proportion is probably higher than in the former group.

(2) The convalescent hospitals discharge fewer scarlet fever infecting cases in proportion than the acute hospitals.

(3) Classification in scarlet fever has not yet caused any notable reduction in the infectivity rate.

(4) In diphtheria cases the adoption of routine bacteriological examination before discharge has not caused any reduction in the infectivity rate.

(5) The connection between a high infectivity rate and the weather is not close enough to permit of any notable reduction of return cases by withholding the discharge of patients on bad days.

(6) In regard to Group C., diphtheria following discharge of a scarlet fever case, it has been suggested that a routine examination of scarlet fever patients for diphtheria bacilli before discharge would abolish such outbreaks. In the light of the very inconclusive results obtained hitherto by bacteriology in reducing return diphtheria cases, I cannot recommend its adoption for scarlet fever.

These conclusions as a whole are disappointing. Had a positive result been obtained in each of the above lines of inquiry, we might have hoped to adopt measures to seriously reduce the percentage of infecting cases discharged.

The lower proportion at the convalescent hospitals is undoubted; and past experience leads to the hope that return cases might be reduced to about two-thirds or less of the present number by discharging all cases from the convalescent hospitals. The experience of the three years does not lead to any similar hope as regards further classification or bacteriological examination. It is true that classification has hardly had a fair trial, and other systems or a further trial of those already in use may give better results.

I have to thank many of the Medical Officers in the Board's service for assistance in preparing this report. I have also to acknowledge the help of Mr. Beresford, my clerk, in the tracing of cases and other portions of the work.

F. M. TURNER.

January, 1906.

SUMMARY OF OUTBREAKS.

TABLE I.—Summary of Return Outbreaks dealt with in this Report.

	1902	1903	1904	Total.
Group A.—Scarlet fever in both infecting and infected cases :—				
Outbreaks arising after discharge of a primary scarlet fever case	502	370	260	1,132
,, ,, before discharge of a primary scarlet fever case	4	4	2	10
,, ,, after discharge of a secondary scarlet fever case	14	12	8	34
Total	520	386	270	1,176
Group B.—Diphtheria in both infecting and infected cases :—				
Outbreaks arising after discharge of a primary diphtheria case	60	61	33	154*
,, ,, before discharge of a primary diphtheria case	4	—	—	4
,, ,, after discharge of a secondary diphtheria case	2	1	3	6
,, ,, before discharge of a secondary diphtheria case	—	—	1	1
Total	66	62	37	165*
Group C.—Infecting case scarlet fever, infected case diphtheria	67	30	4	101
Group D.—Infecting case diphtheria, infected case scarlet fever	25	13	6	44
Group E.—Diagnosis of either the infecting or infected case not confirmed in hospital	25	23	13	61
Group F.—Cases untraced	10	6	7	23
Grand Total	713	520	337	1,570

* Adding the three outbreaks given in detail on p. 3 these figures become 157 and 168 respectively.

TABLE II.—Showing the number of Infecting and Infected cases in each Outbreak.

Infecting cases.	Infected cases.	No. of Outbreaks.	No. of Infecting cases (Scarlet fever only).	No. of Infected cases (Scarlet fever only).
Group A.				
1 scarlet fever	1 scarlet fever	873	873	873
1 ,,	2 ,,	144	144	288
1 ,,	3 ,,	35	35	105
1 ,,	4 ,,	10	10	40
1 ,,	5 ,,	3	3	15
1 ,,	1 ,, and 1 diphtheria	5	5	5
1 ,,	2 ,, ,, 1 ,,	3	3	6
1 ,,	1 ,, ,, 2 ,,	1	1	1
1 ,,	1 ,, ,, 3 ,,	1	1	1
1 ,,	1 ,, ,, 1 other disease	3	3	3
1 ,,	2 ,, ,, 1 ,,	1	1	2
1 ,,	1 ,, ,, 2 ,,	1	1	1
1 ,,	3 ,, ,, 2 ,,	1	1	3
2 ,,	2 ,,	11	22	22
2 ,,	2 ,, and 1 diphtheria	1	2	2
3 ,,	2 ,,	2	6	4
2 ,,	1 ,, and 1 diphtheria	1	2	1
2 ,,	1 ,,	57	114	57
3 ,,	1 ,,	7	21	7
4 ,,	1 ,,	1	4	1
5 ,,	1 ,,	1	5	1
1 ,, and 1 diphtheria	1 ,,	1	1	1
1 ,, ,, 1 ,,	1 ,, and 1 diphtheria	1	1	1
2 ,, ,, 1 other disease	1 ,,	1	2	1
1 ,, 1 diphtheria, and 1 other disease	1 ,,	1	1	1
	Total	1,166	1,262	1,442
Group B.			(Diphtheria cases only).	(Diphtheria cases only).
1 diphtheria	1 diphtheria	125	125	125
1 ,,	2 ,,	11	11	22
1 ,,	1 ,, and 1 scarlet fever	4	4	4
1 ,,	1 ,, ,, 1 other disease	1	1	1
1 ,,	3 ,,	3	3	9
1 ,,	4 ,,	1	1	4
2 ,,	1 ,, and 1 scarlet fever	1	2	1
3 ,,	2 ,,	1	3	2
7 ,,	3 ,,	1	7	3
2 ,,	1 ,,	9	18	9
1 ,, and 1 scarlet fever	1 ,,	1	1	1
3 ,,	1 ,,	2	6	2
	Total	160	182	183
Group C.				
1 scarlet fever	1 diphtheria	82	82	82
1 ,,	2 ,,	15	15	30
1 ,,	3 ,,	3	3	9
1 ,,	4 ,,	1	1	4
	Total	101	101	125
Group D.				
1 diphtheria	1 scarlet fever	38	38	38
1 ,,	2 ,,	5	5	10
1 ,,	3 ,,	1	1	3
	Total	44	44	51

THE INTERVAL.

TABLE III.

Interval between the discharge of the Infecting case and the origin of the Outbreak.

Interval in days.	NUMBER OF OUTBREAKS.				Interval in days.	NUMBER OF OUT-BREAKS.			
	Group A. (Scarlet fever—scarlet fever)	Group B. (Diphtheria-diphtheria.)	Group C. (Scarlet fever—diphtheria.)	Group D. (Diphtheria—scarlet fever.)		Group A. (Scarlet fever—scarlet fever)	Group B. (Diphtheria-diphtheria.)	Group C. (Scarlet fever—diphtheria.)	Group D. (Diphtheria—scarlet fever.)
—8	1	—	—	—	38	3	1	—	2
—7	—	—	—	—	39	3	1	—	1
—6	—	1	—	—	40	2	—	—	1
—5	—	1	—	—	41	—	—	—	—
—4	1	—	—	—	42	1	1	—	—
—3	1	—	—	—	43	—	—	1	—
—2	4	—	—	—	44	4	—	—	—
—1	3	3	—	—	45	—	1	—	—
0	8	1	—	—	46	1	—	—	—
+1	15	—	2	1	47	—	—	—	—
2	49	2	—	4	48	—	—	—	—
3	95	9	6	2	49	—	1	—	—
4	87	11	7	2	50	—	—	—	—
5	103	8	6	7	51	2	3	—	—
6	84	12	6	6	52	1	—	—	—
7	74	7	8	2	53	—	—	—	—
8	58	7	3	2	54	—	—	—	1
9	46	5	2	—	55	—	—	—	—
10	54	10	4	2	56	—	—	—	—
11	41	7	2	—	57	—	1	1	—
12	34	9	5	1	58	—	—	—	—
13	40	7	4	2	59	—	—	—	—
14	24	3	2	—	60	—	1	—	—
15	31	3	2	3	61	—	—	1	—
16	34	3	5	—	62	—	—	—	—
17	30	5	6	—	63	—	—	—	—
18	19	5	1	—	64	1	—	—	—
19	14	2	2	—	65	—	—	—	—
20	23	2	3	—	66	—	—	—	—
21	20	3	2	1	67	—	—	1	—
22	16	1	—	2	68	—	—	—	—
23	9	5	—	—	69	—	—	—	—
24	7	2	1	—	70	—	—	—	—
25	8	3	—	1	71	—	—	—	—
26	9	3	2	—	72	—	—	—	—
27	7	2	1	—	73	—	—	—	—
28	8	1	2	—	74	1	—	—	—
29	11	1	—	—	75	—	1	—	—
30	7	—	1	—	76	1	—	—	—
31	9	—	1	—	77	—	—	—	—
32	8	1	2	—	78	—	—	—	—
33	8	—	—	—	79	—	—	—	—
34	1	—	1	—	80	—	—	—	—
35	1	1	—	—	—	—	—	—	—
36	6	2	—	—	100	1	—	—	—
37	—	1	—	—					
					Total	1,129	160	93	43
Interval uncertain, two or more infecting cases having been discharged on different days ...						47	8	8	1
					Total	1,176	168	101	44

MORTALITY OF RETURN CASES.

TABLE IV.

Result in infected cases; and the case mortality of infected cases compared with case mortality of all cases suffering from the same disease completed during the three years.

		Return Cases.				Total Completed Cases.			
		Recoveries.	Deaths.	Total.	Case Mortality.	Recoveries.	Deaths.	Total.	Case Mortality.
Scarlet Fever	Group A ...	1,391	45	1,436*	3·13	35,516	1,209	36,725	3·29
	" D ...	49	2	51	3·9				
Diphtheria.	" B ...	167	13	180	7·2	15,105	1,712	16,817	10·18
	" C ...	111	14	125	11.2				

* In addition to these, six infected cases were reported from outside the Board's hospitals, the results of which are not known.

CASES CROSSING FROM ONE HOSPITAL TO ANOTHER.

TABLE V.—Group A only.

		Hospital from which infecting case was discharged.											
		E. H.	N. E. H.	N.W. H.	W. H.	S. W. H.	F. H.	G. H.	S. E. H.	P. H.	B. H.	N. H.	Total.
Hospital to which infected case was admitted.*	E. H.	21	17	—	—	1	—	—	1	4	1	13	58
	N. E. H. ...	8	88	9	—	1	—	—	1	—	1	36	144
	N.W.H. ...	1	10	28	5	1	—	1	—	—	—	18	64
	W. H.... ...	—	2	8	60	3	8	6	—	—	—	49	136
	S. W. H. ...	—	—	1	—	39	18	6	4	9	2	14	93
	F. H.	—	—	—	5	21	44	4	2	5	—	26	107
	G. H.	—	—	—	7	9	16	65	—	1	1	19	118
	S. E. H. ...	3	2	—	—	2	1	—	17	16	5	12	58
	P. H.	—	3	1	—	12	6	2	16	147	22	17	226
	B. H.	1	—	—	—	—	2	—	6	24	148	6	187
Cases not removed to the Board's hospitals ...		—	—	—	1	1	—	1	—	—	—	—	3
Total		34	122	47	78	90	95	85	47	206	180	210	1,194

* Outbreaks in which infected cases were taken into two or three hospitals have been counted twice or thrice.

TABLE V*a*.—Group A only.

———	1902.	1903.	1904.	Total.
Infected case admitted to the same hospital as that from which the infecting case was discharged...	238	257	162	657
Infected case admitted to a different hospital...	300	132	105	537
Total	538	389	267	1,194
Percentage admitted to a different hospital	55·7	34·0	39·3	45·0

SCARLET FEVER.—INFECTIVITY RATES AT THE DIFFERENT HOSPITALS.

TABLE VI.—Group A.

Yearly discharges of primary scarlet fever cases from each of the Board's hospitals, and number of return outbreaks of scarlet fever arising subsequent to each group of cases.

Year.	—	E. H.	N. E. H.	N. W. H.	W. H.	S. W. H.	F. H. Acute.	G. H.	S. E. H.	P. H.	B. H.	Convalescent Hospitals.		Total.	Corrected totals (the defective figures from the N. W. H. being omitted).
												N. H.	F. H.		
1902 ...	Total discharges	139	1,593	892	944	944	1,678	354	472	1,879	1,623	4,134	—	14,652	14,652
	Return outbreaks	4	37	39	33	34	64	12	18	93	64	92	—	490	490
	Infectivity rate per cent. ...	2·87	2·32	4·38	3·50	3·60	3.82	3·40	3·82	4·94	3·94	2·22	—	3·34	3·34
1903 ...	Total discharges	463	1,309	527	840	803	627	903	410	1,159	1,344	2,389	—	10,774	10,247
	Return outbreaks	17	48	4*	22	32	11	47	19	50	68	48	—	366	366
	Infectivity rate per cent. ...	3·67	3·67	—	2·62	3·98	1·76	5·20	4·64	4·31	5·05	2·01	—	3·40	3·57
1904 ...	Total discharges	257	1,393	388	536	612	—	495	36	1,192	1,109	3,616	456	10,090	9,702
	Return outbreaks	9	32	2*	18	15	—	21	3	44	40	60	13	257	257
	Infectivity rate per cent. ...	3·50	2·29	—	3·36	2·45	—	4·24	8·33	3 69	3·61	1·66	2·85	2·55	2·65
Totals for the 3 years.	Total discharges	859	4,295	1,807	2,320	2,359	2,305	1,752	918	4,230	4,076	10,139	456	35,516	34,601
	Return outbreaks	30	117	45*	73	81	75	80	40	187	172	200	13	1,113†	1,113†
	Infectivity rate per cent. ...	3·50	2·72	2·49*	3·14	3·43	3·24	4·55	4·36	4·42	4·20	1·97	2·85	3·19	3·22

* Notification of return cases was discontinued at the North Western Hospital in the course of 1903. The figures for this hospital are, therefore, inaccurate. The totals given in the last column but one are affected by this error, which has been corrected as far as possible in the figures of the last column by the omission of the North Western cases.

† In addition to these, 19 Outbreaks occurred, the source of which was uncertain, infecting cases having been discharged from more than one hospital.

TABLE VII.—Group A.

Discharged primary scarlet fever cases from each acute hospital, both direct and indirect (*i.e.* after transfer to a convalescent hospital) and return outbreaks arising subsequently.

—	—	E. H.	N. E. H.	N. W. H.	W. H.	S. W. H.	F. H.	G. H.	S. E. H.	P. H.	B. H.	Total.
Total discharges	Direct	859	4,295	1,807	2,320	2,359	2,305	1,752	918	4,230	4,076	24,921
	Indirect	852	1,771	3,329	1,246	661	803	826	761	396	90	10,735†
	Total	1,711	6,066	5,136	3,566	3,020	3,108	2,578	1,679	4,626	4,166	35,656
Return outbreaks	Direct	30	117	45*	73	81	75	80	40	187	172	900
	Indirect	15	39	32*	40	14	22	24	13	11	—	210
	Total	45	156	77*	113	95	97	104	53	198	172	1,110‡
Infectivity rate per cent.	On direct discharges only	3·50	2·72	2·49*	3·14	3·43	3·24	4·55	4·36	4·42	4·20	3·61
	On total discharges	2·63	2·57	1·50*	3·17	3·14	3·12	4·04	3·15	4·38	4·13	3·12

* Figures imperfect, *see* note to Table VI.

† The correct number, as given in Table VI (N. and F. hospitals), was 10,595. The error is chiefly due to 128 cases which were re-admitted to one or other of the acute hospitals. I have not had the time to trace these and get the table correct.

‡ Three cases included in Table VI. have been omitted from this table, since in each two Infecting cases were transferred from different acute hospitals to the Northern.

PERIOD OF DETENTION.

TABLE VIII.—Period of detention of infecting cases (primary scarlet fever only).

Detention in Days.	1902.	1903.	1904.	Total.
14 to 20	2	—	—	2
21—	3	2	1	6
28—	4	11	4	19
35—	18	18	13	49
42—	82	57	41	180
49—	96	62	58	216
56—	83	48	44	175
63—	68	45	26	139
70—	46	30	13	89
77—	35	25	11	71
84—	14	16	7	37
91—	11	13	14	38
98—	2	7	4	13
105—	10	4	3	17
112—	3	5	3	11
119—	1	2	4	7
126—	3	2	—	5
133—	3	1	1	5
140—	—	—	—	—
147—	—	1	—	1
154—	—	—	1	1
161—	2	1	—	3
168—175	—	—	1	1
Total	486	350	249	1,085
Period of detention uncertain, two or more infecting cases having been discharged after different periods of detention	16	20	11	47
Total	502	370	260	1,132

TABLE IX.—Infectivity rate among primary scarlet fever cases discharged after different periods of detention, 1904 only.

Detention in Days.	Total Discharges.	Return Outbreaks.	Infecting Rate per cent.
14—20	11	—	0·0
21—	53	1	1·89
28—	214	4	1·87
35—	567	13	2·29
42—	1,398	41	2·93
49—	1,735	58	3·28
56—	1,564	44	2·81
63—	1,178	26	2·20
70—	772	13	1·69
77—	640	11	1·72
84—	468	7	1·50
91—	394	14	3·56
98—	277	4	1·45
105—	207	3	1·45
112—	165	3	1·82
119—	126	4	3·18
126—	91	—	0·0
133—	70	1	1·43
140—	43	—	0·0
147—	32	—	0·0
154—	26	1	3·84
161—	18	—	0·0
168—	14	1	7·15
175—	9	—	0·0
182—	5	—	0·0
189—	6	—	0·0
196—	1	—	0·0
203—	2	—	0·0
210—	3	—	0 0
217—	—	—	0·0
224—	1	—	0·0
231—238	5	—	0·0
Total	10,095	249	

SEASONAL INFECTIVITY RATES.

TABLE X.—GROUP A.

Discharges of primary scarlet fever cases from all the Board's Hospitals for each month, and number of return outbreaks arising subsequent to each group of cases.

Year.		Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1902	Total discharges	1,633	1,110	1,232	975	1,089	939	1,304	1,103	1,281	1,409	1,322	1,255	14,652
	Return outbreaks	66	48	52	44	32	20	44	41	28	35	31	48	489
	Infectivity rate per cent.	4·0	4·3	4·2	4·5	2·9	2·1	3·4	3·7	2·2	2·5	2·3	3·8	3·34
1903	Total discharges	1,314	907	886	849	826	822	927	792	889	958	762	842	10,774
	Return outbreaks	47	29	35	29	33	19	23	27	31	32	23	34	362
	Infectivity rate per cent.	3·6	3·2	3·9	3·4	4·0	2·3	2·5	3·4	3·5	3·3	3·0	4·0	3·36
1904	Total discharges	700	640	712	702	711	813	814	821	906	914	1,140	1,217	10.090
	Return outbreaks	19	27	15	12	13	15	17	20	26	31	26	35	256
	Infectivity rate per cent.	2·7	4·2	2·1	1·7	1·8	1·8	2·1	2·4	2·9	3·4	2·3	2·9	2·54
Totals for the 3 years	Total discharges	3,647	2,657	2,830	2,526	2,626	2,574	3,045	2,716	3,076	3,281	3,224	3,314	35,516
	Return outbreaks	132	104	102	85	78	54	84	88	85	98	80	117	1,107*
	Infectivity rate per cent.	3·62	3·89	3·64	3·32	2·93	2·10	2·76	3·24	2·76	2·98	2·48	3·53	3·12

* In addition to these, 25 outbreaks occurred in which the month of discharge of the infecting case was uncertain, two or more cases having been discharged not in the same month.

DIPHTHERIA—INFECTIVITY RATES AT THE DIFFERENT HOSPITALS.

TABLE XI.—GROUP B.

Yearly discharges of primary diphtheria cases from each of the Board's Hospitals, and number of return outbreaks of diphtheria arising subsequent to each group of cases.

Year.		E. H.	N. E. H.	N. W. H.	W. H.	S. W. H.	F. H.	G. H.	S. E. H.	P. H.	B. H.	N. H.	Total.
1902	Total discharges	845	555	742	672	393	3	973	537	421	652	337	6.130
	Return outbreaks	10	2	5	9	4	0	16	2	4	7	1	60
													Rate per cent 0·98
1903	Total discharges	439	318	488	597	358	2	681	466	524	629	325	4.827
	Return outbreaks	8	1	2†	4	2	0	11	6	12	7	7	59
													Rate per cent. 1·22
1904	Total discharges	401	422	355	344	338	0	459	47	540	548	694	4,148
	Return outbreaks	4	5	0†	4	2	0	9	0	4	3	3	32
													Rate per cent. 0·77
Totals for the 3 years	Total discharges	1,685	1,295	1,585	1,613	1,089	5	2,113	1,050	1,485	1,829	1,356	15,105
	Return outbreaks	22	8	7†	17	8	0	36	8	20	17	11	154‡
	Infectivity rate per cent.	1·30	0·62	0·44†	1·05	0·73	0·0	1·70	0·76	1·35	0·93	0·81	Rate per cent. 1·02

† These figures are probably understated, notification of return cases having been in abeyance at the North Western Hospital.
‡ In addition to these the source of three outbreaks was uncertain, infecting cases having been discharged from more than one hospital.

TABLE XII.

Hospitals using the bacteriological test as a routine practice.			Other Hospitals.		
Hospital.	Diphtheria discharges.	Infecting cases.	Hospital.	Diphtheria discharges.	Infecting cases.
Eastern, after November, 1902...	974	12	Eastern, before November, 1902...	711	11
North Eastern, after March, 1904	351	4	North Eastern, before March, 1904	944	4
Grove	2,113	36	Western	1,613	17
South Eastern	1,050	8	South Western	1,089	8
Brook	1,829	16	Park	1,485	20
Northern	1,356	11			
Total	7,673	87	Total	5,842	60
Infectivity rate, 1·13.			Infectivity rate, 1·02.		

TABLE XIIA.—Infectivity Rate at the two Hospitals which have changed their practice.

Hospital.	Before adopting the bacteriological test as a routine practice.		After adopting the bacteriological test as a routine practice.	
	Diphtheria discharges.	Infecting cases.	Diphtheria discharges.	Infecting cases.
Eastern	711	11	974	12
North Eastern	944	4	351	4
Total	1,655	15	1,325	16
Infectivity rate...	0·91		1·21	

WEATHER AND INFECTIVITY RATE.

TABLE XIII.—Temperature and Infectivity Rate throughout the 1st quarter of 1904.

	No. of scarlet fever patients discharged.†	No. of subsequent return outbreaks.	Infectivity rate, per cent.
1 day on which the temperature was more than 10° below the average	13	1	7·7
14 days ,, ,, from 10° to 5° ,, ,,	436	11	2·5
25 ,, ,, ,, ,, 5° to 0° ,, ,,	642	24	3·7
29 ,, ,, ,, ,, 0° to 5° above ,,	724	16	2·2
14 ,, ,, ,, ,, 5° to 10° ,, ,,	246	7	2·8
1 day ,, ,, more than 10° ,, ,,	69	1	1·4
81* Total	2,130	60	2·8

* On 10 days during the quarter no patients were discharged.
† The figures in this column have not been corrected for errors in diagnosis.

TABLE XIV.—Rainfall and Infectivity Rate throughout the 1st quarter of 1904.

	No. of scarlet fever patients discharged.†	No. of subsequent return outbreaks.	Infectivity rate, per cent.
38 days without rainfall	957	27	2·8
22 ,, with rainfall less than ·10 inch	527	15	2·8
9 ,, ,, between ·10 and ·19 inch	269	9	3·3
7 ,, ,, ,, ·20 ,, ·29 ,, ...	228	7	3·1
4 ,, ,, ,, ·30 ,, ·39 ,, ...	97	1	1·0
1 ,, ,, over ·40 inch	52	1	1·9
81* Total	2,130	60	2·8

* † See notes to Table XIII.

TABLE XV.—Direction of wind and infectivity rate throughout the 1st quarter of 1904.

	No. of scarlet fever patients discharged †	No. of subsequent return outbreaks.	Infectivity rate per cent.
16 days with easterly winds (N.E. to S.E.)	490	22	4·5
15 ,, northerly winds (N.E. to N.W.)	339	9	2·7
10 ,, westerly winds (N.W. to S.W.)	257	3	1·2
28 ,, southerly winds (S.W. to S.E.)	704	21	3·0
12 ,, variable winds, or calm, or winds exactly N.E., N.W., S.E. or S.W.	340	5	1·5
81* Total	2,130	60	2·8

* † See notes to Table XIII.

TABLE XVI.—Velocity of wind and infectivity rate throughout the 1st quarter of 1904.

	No. of scarlet fever patients discharged.†	No. of subsequent return outbreaks.	Infectivity rate per cent.
3 days on which the wind registered less than 100 miles ...	107	3	2·8
19 ,, ,, ,, between 100 and 200 miles	460	16	3·5
23 ,, ,, ,, ,, 200 and 300 ,,	499	16	3·2
14 ,, ,, ,, ,, 300 and 400 ,,	353	10	2·8
9 ,, ,, ,, ,, 400 and 500 ,,	322	7	2·2
8 ,, ,, ,, ,, 500 and 600 ,,	178	5	2·8
2 ,, ,, ,, ,, 600 and 700 ,,	96	2	2·1
3 ,, ,, ,, ,, 700 and 800 ,,	115	1	0·9
81* Total	2,130	60	2·8

* † See notes to Table XIII.

TABLE XVII.—Direction of wind and infectivity rate throughout 1904.

	No of scarlet fever patients discharged †	No. of subsequent return outbreaks.	Infectivity rate per cent.
51 days with easterly winds (S.E. to N.E.)	1,486	44	2·96
50 ,, northerly winds (N.E. to N.W.)	1,612	41	2·54
111 ,, westerly winds (N.W. to S.W.)	3,983	77	1·93
53 ,, southerly winds (S.W. to S.E.)	1,649	51	3·09
55 ,, variable winds, or calm, or winds exactly N.E., N.W., S.E. or S.W.	1,816	37	2·04
320* Total	10,546	250‡	2·36

* On 46 days during the year no patients were discharged. † See note to Table XIII.

‡ In addition to these, 10 outbreaks occurred in which two or more infecting cases were discharged on different days.

TABLES COMPILED FROM THE EASTERN HOSPITAL RECORDS OF 1,000 CONSECUTIVE CASES.

(TABLE XX., which is placed in this section for comparison, refers to the larger number of cases from all the hospitals.)

TABLE XVIII.—Period of detention in infecting and non-infecting cases among 1,000 consecutive scarlet fever admissions to the Eastern Hospital.

Detention in weeks	0–1	–2	–3	–4	–5	–6	–7	–8	–9	–10	–11	–12	–13	–14	–15	–16	–17	–18	–19	–20	–21	–22	–23	–24	–25	–26	–27	–28	35–6	Total.
Infecting cases	—	—	—	1	3	2	2	8	7	2	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26
Non-infecting cases	—	—	—	10	50	38	120	172	138	117	69	84	35	34	30	26	16	10	8	6	1	3	—	3	—	1	1	1	1	974
Total	—	—	—	11	53	40	122	180	145	119	69	84	35	34	31	26	16	10	8	6	1	3	—	3	—	1	1	1	1	1,000

TABLE XIX.—Period of detention in infecting and non-infecting cases among 1,000 consecutive scarlet fever admissions to the Eastern Hospital.

	Detention in weeks	Under 6	6–8	8–10	10–12	Over 12	Total.
Cases without complications	Infecting	4	4	5	0	0	13
	Non-infecting	67	151	110	34	22	384
	Total	71	155	115	34	22	397
	Infectivity rate per cent.	5·6	2·6	4·3	0·0	0·0	3·27
Cases with rhinorrhoea	Infecting	1	4	4	0	0	9
	Non-infecting	12	58	84	66	114	334
	Total	13	62	88	66	114	343
	Infectivity rate per cent.	7·7	6·5	4·5	0·0	0·0	2·62
Cases with other complications	Infecting	1	2	0	0	1	4
	Non-infecting	19	83	61	53	40	256
	Total	20	85	61	53	41	260
	Infectivity rate per cent.	5·0	2·4	0·0	0·0	2·4	1·54
Total	Infecting	6	10	9	0	1	26
	Non-infecting	98	292	255	153	176	974
	Total	104	302	264	153	177	1,000
	Infectivity rate per cent.	5·8	3·3	3·4	0·0	0·6	2·6

TABLE XX.

Mean period of detention in days of infecting and total Scarlet Fever Cases. All the hospitals, 1902–4.

	Infecting Cases.	All Discharged Cases.
1902	62·3	64·4
1903	63·2	64·6
1904	62·6	66·1
Totals for three years	62·7	64·9

TABLE XXI.

Mean period of detention in days of infecting and total Cases. 1,000 consecutive Scarlet Fever Cases from Eastern Hospital.

	INFECTING CASES.		All Discharged Cases.
	Including Doubtful Cases.	Excluding Doubtful Cases.	
Uncomplicated Cases	48·5	49·0	54·9
Rhinorrhœa Cases	55·3	50·8	77·4
Other complications	60·7	60·7	65·7
Total	52·7	52·3	65·4

RECURRENT OUTBREAKS.

TABLE XXII.—Details of Recurrent Return Outbreaks in the same house.

Infecting Case.					First Return Outbreak.									Second Return Outbreak.							
Name.	Age.	Disease.	Date of Discharge.	Hospital.	Reference No.	Group.	Name.	Age.	Disease.	Date of Onset of Disease.	Date of Admission.	Date of Discharge.	Hospital.	Reference No.	Group.	Name.	Age.	Disease.	Date of Onset of Disease.	Date of Admission.	Hospital.
			1901.							1902.	1902.	1902.							1902.	1902.	
D. F. ...	8	Diph. ...	Dec. 14	W. ...	—	D	V. F. ...	3	Scarlet .	Jan. 18	Jan. 20	Mar. 12	S. W.	159	A	F. F.	13	Scarlet .	Mar. 27	Mar. 28	W.
																D. F.	8	Tonsilitis	Mar. 22	Mar. 26	W.
			1902.																		
F. H. ...	6	Scarlet .	Jan. 15	E. & N.	27	A	C. H. ...	8	Scarlet .	Jan. 19	Jan. 20	Apr. 19	B. ...	267	A	M. H....	10 weeks	Scarlet .	Apr. 24	Apr. 26	B.
T. G. ...	6	Scarlet .	Feb. 5	B. ...	81	A	C. G. ...	2	Scarlet .	Feb. 11	Feb. 11	Mar. 27	B. ..	226	A	J. G...	5	Scarlet .	Apr. 6	Apr. 7	B.
																E. G...	27	Scarlet .	Apr. 7	Apr. 10	B.
B. S ...	4	Scarlet .	Jan. 2	N. E.	58	A	N. M. S.	5	Scarlet .	Jan. 31	Feb. 6	May 1	W. ..	319	C	G. V. S.	2	Diph. ...	—	May 29	W.
E. W. ...	10	Scarlet .	Jan. 22	S. E.	95	A	M. W..	8	Scarlet .	Feb. 12	Feb. 15	April 23	S.W.	277	A	H.A.W.	3½	Scarlet .	May 2	May 5	F.
							The following case also in the same family was not infected in the first return outbreak, but may have been the source of infection in the second.														
							H. W. .	6	Scarlet .	—	Oct. 4	May 2	P. ...								
N. P. ...	15	Scarlet .	Jan. 11	B. ...	118	A	O. H. ...	4	Scarlet .	Feb. 16	Feb. 18	Apr. 8	P. ...	243	A	N. P. ...	15	Scarlet .	Apr. 13	Apr. 16	S. E.
															(This patient was the same as the first infecting case)						
G. R. ...	7	Scarlet .	Feb. 12	B. ...	129	A	P. R...	3	Scarlet .	—	Mar. 24	May 13	B. ...	327	C	R R. ...	7	Diph. ...	May 31	June 2	P.
							S. R...	2	Scarlet .	—	Mar. 24	May 13	B. ...								
W. N. W.	6	Scarlet .	Feb. 26	F. ...	201	A	E. A. W.	15	Scarlet .	Mar. 1	Mar. 2	Apr. 19	F. ...	254	A	E C. W.	4	Scarlet .	Apr. 21	Apr. 21	F.
J. C....	1	Diph. ...	April 2	B ...	219	B	L. J. ...	8	Diph. ..	April 7	April 8	May 29	B ...	346A	B	K. J. ...	9 mths.	Diph. ...	June 13	June 16	P.
T. J....	6	Diph. ...	April 2	B ...			F. C. ...	9	Scarlet .	April 5	April 6	June 14	B ...	346	A	A. C. ...	7	Scarlet .	June 20	June 20	B.
E. A. ...	8	Scarlet .	May 14	N. W. and N.	312	A	H. J. A.	6	Scarlet .	May 24	May 24	July 17	N. W. and N.	425	A	J. A. ...	3	Scarlet .	July 31	Aug. 2	N. W.
A. M. ...	14	Scarlet .	April 30	S. E.	411	A	F. M. ...	3	Scarlet .	—	May 24	June 30	P. ...	417	A	M. Q. ...	5	Scarlet .	Aug. 1	Aug. 2	P.
A. R. ...	4	Scarlet .	Sept. 19	S. E.	536	A	F. R. ...	7	Scarlet .	Sept. 22	Sept. 25	Nov. 7	P. ...	630	A	R. R. ...	8	Scarlet .	Nov. 20	Nov. 21	P.
							A. R. ...	2	Erythema	Sept. 22	Sept. 25	Nov. 7	P. ...								
							N. R. ...	5	Scarlet .	—	Sept. 29	Nov. 14	B. ...								
K. C. ...	7	Scarlet .	Oct. 20	W. ...	601	A	F. M. C.	5	Scarlet .	Oct. 30	Oct. 31	Dec. 12	W. ...	701	A	K. C. ...	12	Scarlet .	Dec. 26	Dec. 28	F.
																K. C. ...	5	Scarlet .	Dec. 26	Dec. 27	F.
										1903	1903	1903							1903	1903	
S. F. ...	5	Scarlet .	Dec. 24	P. ...	725	A	F. G. F.	7	Scarlet .	Jan. 10	Jan. 13	Feb. 27	P. ...	908	C	S. F. ...	5	Diph. ...	Mar. 3	Mar. 7	P.
							F. F. ...	4	Scarlet .	Jan. 18	Jan. 20	Feb. 27	P. ...								

(This patient was the same as the first infecting case, but on this occasion was re-admitted with a different disease.)

RECURRENT OUTBREAKS—*continued.*

TABLE XXII.—Details of Recurrent Return Outbreaks in the same house—*continued.*

Infecting Case.					First Return Outbreak.									Second Return Outbreak.							
Name.	Age.	Disease.	Date of Discharge.	Hospital.	Reference No.	Group.	Name.	Age.	Disease.	Date of Onset of Disease.	Date of Admission.	Date of Discharge.	Hospital.	Reference No.	Group.	Name.	Age.	Disease.	Date of Onset of Disease.	Date of Admission.	Hospital.
I. M. ...	12	Scarlet .	1903 Jan. 14	B. ...	813	A	J. M. ...	3	Scarlet .	—	1903 Jan. 16	1903 Mar. 2	B ...	912	A	G. M. ...	8 mths.	Scarlet .	1903 Mar. 9	1903 Mar. 11	B.
														After the discharge of this patient on April 11th a third outbreak occurred, viz.:—							
														975	A	J. M. ...	10	Scarlet .	Apr. 16	Apr. 17	B.
M. T. ...	4	Scarlet .	Feb. 5	W. ...	860	A	R. T. ...	3	Scarlet .	Feb. 10	Feb. 10	Apr. 16	W. ...	1003	A	M. J. T.	12	Scarlet .	May 1	May 3	W.
							O. T. ...	1	Scarlet .	Feb. 9	Feb. 10	July 23	W. ...								
							R. T. ...	5	Scarlet .	—	Feb. 11	May 2	W.&N.								
J. F. B. ..	2	Diph. ...	Jan. 12	G. ...	922	B	D. B. ...	4	Diph. ...	Mar. 13	Mar. 16	Apr. 26	G. ...	1069	B	T. L. ...	23	Diph. ...	June 6	June 8	G.
J. R. ...	5	Scarlet .	Feb. 13	P. ...	883	C	M. R. ...	3	Diph. ...	Feb. 20	Feb. 23	May 9	P. ...	1029	B	K. R. ...	9	Diph. ...	May 12	May 13	P.
L. P. ...	11	Scarlet .	Apr. 22	B. ...	1022	A	A. P. ...	15	Scarlet .	May 8	May 12	July 9	B ...	1108	A	A. P. ...	34	Scarlet .	July 13	July 14	B.
							F. P. ...	13	Scarlet .	May 8	May 12	June 27	B. ...								
E. R. ..	7	Scarlet .	May 27	B. ...	1062	A	F. R. ...	9	Scarlet .	May 30	May 31	July 24	P. ...	1127	A	I. S. ...	3	Scarlet .	July 24	July 30	P.
C. B. ...	17	Diph. ...	May 25	E. ...	1090	D	W. T....	15	Scarlet .	June 16	June 17	Aug. 8	E. ...	1116	A	E. B ...	4	Scarlet .	July 22	July 23	E.
							G. B. ...	1	Scarlet .	June 16	June 17	July 14	E. ...								
M. F. ...	4	Scarlet .	Dec. 9	B. ...	1288	A	F. F. ...	4	Scarlet . Developed diphtheria on Feb. 15, '904.	Dec. 11	Dec. 13	1904 Mar 25	B. ...	2069	B	D. F. ...	4	Diph. ...	1904 Mar. 20	1904 Mar. 29	B.
W. A. ...	8	Scarlet .	Dec. 16	P. ...	1319	A	M. A. ...	11	Scarlet .	1904 Jan. 7	1904 Jan. 7	Feb. 26	P. ...	2043	A	S. A. ...	18	Scarlet .	Feb. 29	Mar. 1	P.
							L. A. ...	2	Scarlet .	Jan. 5	Jan. 7	Feb. 26	P. ...								
A. E. S...	3	Scarlet .	Dec. 18	G. ...	1318	A	E. H. S.	6	Scarlet .	Jan. 3	Jan. 5	Feb. 23	G. ...	2042	A	M. S. ...	2	Scarlet .	Feb. 29	Mar. 1	G.
D. A. ...	3	Scarlet .	1904 Feb. 17	P. ...	2047	A	J. A. ...	9	Scarlet .	Mar. 2	Mar. 5	May 2	P. ...	2097	A	F. A. ...	1	Scarlet .	May 19	May 20	P.
D. A. ...	7	Scarlet .	Feb. 17	P. ..			H. A. ...	5	Scarlet .	Mar. 6	Mar. 6	May 2	P. ...								
M. P. ...	5	Scarlet .	Apr. 4	N. W.	2080	A	F. P. ...	4	Scarlet .	Apr. 10	Apr. 21	June 13	P. ...	2113	A	L. P. ...	2	Scarlet	June 18	June 20	P.